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CHILD DEVELOPMENT

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ANNOUNCEMENT

To Members of the Society for Research in Child Development

In Making plans to attend the Biennial Meeting December 28 and 29, don't forget the business meeting Thursday morning, December 29.

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THE EFFECT OF HOME ENVIRONMENT ON NURSERY SCHOOL BEHAVIOR

ALFRED L. BALDWIN, PH.D.
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The author, in a previous paper (1), presented some findings from the Fels Research Institute concerning the effects of democracy in the home upon the behavior of the nursery school child. The present report is supplementary; it includes the study of a wider variety of home conditions and employs a more elaborate battery of ratings of the child's behavior. The children in the present study are not identical with those in the previous study although there is some overlap of the two groups.

From the records of the Institute, the Nursery School Behavior ratings of all the children between the age of 36 months and 60 months were selected. In most cases, there were several ratings on each child during that interval. In such a case, the rating closest to 48 months of age was selected. These ratings were then paired with parent behavior ratings made by the Fels Home Visitor. The parent rating most nearly contemporary with the nursery school rating was selected. These procedures provided a group of 56 cases, on whom both nursery school ratings and ratings of the home environment were available.

The Fels Parent Behavior Rating Scales used to describe the home environment of the children have been thoroughly described in various publications. They provide a rating on each of thirty variables whose reliabilities have been shown to be reasonably satisfactory, and whose pattern of interrelationships has been investigated both by clinical and statistical methods. These analyses have shown the fundamental importance of three syndromes of variables, labeled *warmth, democracy,* and *indulgence*. There are other syndromes, but these three have seemed to have the deepest and most widespread impact upon the parent-child relationship.

If the cases in the present study are classified either high or low, upon each of the three syndromes, *warmth, democracy* and *indulgence,* a theoretical eight class situation exists. Two of these eight classes are, for practical purposes, nonexistent. Figure I, shows the distribution of the cases among the eight classes.

Because of the number of cases in two of the classes, the single case in the low warmth, high indulgence, high democracy, group was discarded; the remaining 55 cases were divided into the six groups shown in the table. This classification of the cases on the basis of home environment is constant throughout the rest of the report. The function of this research is to show the similarities in the nursery school behavior of the children from similar types of homes, and to account for the differences in the nursery school behavior of children from different types of homes.

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TABLE 1

MEAN AND STANDARD DEVIATION OF CHILD BEHAVIOR VARIABLES IN SUBGROUPS

Variable	HHH		HLH		HHL		LLH		LHL		LLL	
	Mean	σ	*Mean*	σ	*Mean*	σ	*Mean*	σ	*Mean*	σ	*Mean*	σ
1 Social Interaction	26.87	8.31	22.80	4.75	30.40	6.92	27.44	8.00	30.00	8.09	24.25	7.17
2.1 Exploratory Contacts	10.64	6.71	18.50	6.28	15.20	8.73	17.78	9.21	10.75	4.87	13.12	6.95
3.1 Friendly Play	26.60	7.38	21.80	6.68	31.00	7.87	24.56	6.06	27.50	7.23	22.88	7.41
3.2 Fighting	23.40	7.05	19.00	9.65	26.30	6.10	25.78	10.38	24.25	9.47	21.50	5.68
4.1 Aggression	22.27	8.01	18.00	6.96	25.80	7.77	24.00	11.13	26.25	9.86	19.25	7.33
4.2 Success of Aggression	22.20	7.04	14.80	8.28	26.60	5.20	19.11	7.65	24.00	8.78	18.38	6.17
4.3 Receiving Aggression	22.47	6.02	19.20	6.62	22.60	6.23	25.44	9.00	23.50	8.11	23.12	5.99
4.4 Resisting Aggression	23.53	7.68	18.60	7.31	23.20	7.96	24.33	11.98	21.12	8.27	20.00	7.68
5.1 Seeking Alliance	25.67	9.68	18.60	6.80	27.90	9.12	20.56	7.56	25.75	8.06	21.38	6.75
5.2 Success of Approaches	27.87	8.05	20.20	9.17	29.30	9.49	23.00	9.12	28.38	7.73	23.25	6.53
5.3 Approaches Rejected	19.93	5.58	19.80	9.64	16.60	7.16	22.56	10.98	19.00	4.77	22.12	6.95
5.4 Receiving Alliance	24.53	6.39	19.00	6.63	27.80	8.63	20.44	6.80	28.88	8.05	19.25	5.45
5.5 Accepting Alliance	27.87	7.76	20.80	9.09	30.50	5.85	23.22	8.24	25.88	7.25	23.38	6.54
5.6 Rejecting Alliance	18.58	6.44	22.80	10.26	19.89	6.60	18.22	11.29	18.57	5.86	17.50	4.00
6.1 Bossing	26.20	8.74	23.20	11.82	26.40	8.33	19.00	7.12	29.88	8.82	19.25	9.31
6.2 Success of Bossing	22.80	7.08	16.80	6.91	26.90	7.56	15.89	7.63	29.62	8.43	18.88	7.76
6.3 Receiving Bossing	26.73	6.33	22.20	9.10	24.90	5.70	28.67	6.22	21.50	7.55	24.75	7.03
6.4 Accepting Bossing	24.07	6.56	24.00	9.32	24.00	5.35	29.33	9.86	22.75	9.07	23.75	7.90
7.1 Receiving Attention	24.13	7.02	21.20	7.03	27.20	5.00	21.44	7.36	27.62	7.55	19.12	4.90
7.2 Avoiding Attention	20.87	6.97	31.00	12.79	20.30	8.81	25.11	8.17	14.88	6.16	21.50	7.58
7.3 Seeking Attention	24.42	8.20	22.80	7.17	26.11	6.01	26.11	11.23	27.71	12.16	20.00	7.05

TABLE 1 (*continued*)

Variable	HHH		HLH		HHL		LLH		LHL		LLL	
	Mean	σ	*Mean*	σ	*Mean*	σ	*Mean*	σ	*Mean*	σ	*Mean*	σ
8.1 Inferiority Status	25.00	8.34	29.40	4.76	22.60	6.18	27.78	5.62	19.88	5.84	25.88	4.46
8.2 Protesting Inferiority	25.67	7.72	20.20	9.72	29.20	4.19	26.00	11.84	30.25	9.19	21.25	7.63
9.1 Offering Help	22.73	8.16	25.60	6.97	22.10	7.84	23.22	9.01	22.62	6.42	21.12	4.51
9.2 Success of Offers	20.60	6.86	21.20	7.99	22.90	6.32	20.89	5.42	21.00	5.63	21.71	4.58
9.3 Receiving Help	23.73	6.41	16.60	7.96	24.80	5.23	24.89	10.12	21.00	5.48	23.88	4.05
9.4 Asking Help	27.80	6.67	30.80	4.33	25.90	5.03	27.44	5.27	23.50	6.89	28.75	6.24
10.1 Interaction with Adults	26.93	6.89	31.00	2.97	26.10	5.19	27.11	7.64	27.62	3.71	24.00	5.29
10.2 Friendly Overtures	24.07	8.92	26.60	8.66	22.60	7.93	21.11	7.40	23.62	6.14	21.25	6.78
10.3 Asking Adult Help	26.80	9.02	25.60	11.20	23.70	6.13	25.67	7.55	27.25	4.21	25.62	8.09
10.4 Adult Interference	22.87	5.76	24.40	3.88	25.80	7.36	26.33	7.83	25.62	4.92	23.38	6.52
10.5 Resisting Interference	22.40	8.70	20.40	12.32	24.80	9.15	23.33	11.26	25.00	2.87	23.75	8.42
11.1 Object-Centeredness	24.93	6.68	25.00	7.46	25.60	6.22	27.56	6.32	27.25	6.78	24.50	6.14
11.2 Acquisitiveness	27.80	7.96	23.80	9.85	28.90	6.79	25.78	7.28	30.25	7.14	27.50	7.16
11.3 Orderliness	28.78	3.84	33.80	6.76	23.80	6.74	23.44	9.64	24.62	6.27	23.38	5.52
11.4 Constructiveness	26.87	8.44	16.60	11.11	28.70	9.24	26.00	6.77	30.00	6.10	25.00	7.16
12.1 Imitation	26.07	6.01	29.80	7.63	22.90	6.25	28.67	8.64	20.88	5.28	31.00	6.02
12.2 Dramatic Play	27.93	8.70	21.60	11.15	28.70	9.79	26.22	5.68	31.50	10.31	20.62	6.16
13.1 Expostulation	25.53	8.57	22.80	9.79	28.30	6.99	24.89	9.79	31.75	8.47	21.75	7.21
13.2 Questioning	27.40	7.01	20.60	8.33	33.80	6.82	28.89	7.68	34.88	6.65	24.75	7.15
14.1 Vigor of Activity	24.27	8.39	19.40	7.09	33.60	5.92	28.56	6.72	31.75	4.82	25.88	6.09
14.2 Large Muscle Skill	29.20	6.76	26.80	4.87	37.20	5.95	29.89	6.90	34.62	4.65	28.12	6.03
14.3 Small Muscle Skill	28.33	9.88	26.80	5.19	32.40	8.94	25.22	5.40	33.75	6.76	24.50	6.67
14.4 Physical Apprehension	27.93	6.49	30.20	8.42	17.80	6.37	26.78	10.14	21.25	6.14	24.00	7.18
15.1 Social Apprehension	25.27	8.94	28.60	13.28	20.60	7.35	26.22	8.24	20.38	7.99	24.38	6.38

FIGURE I

THE DISTRIBUTION OF THE CASES AMONG THE EIGHT THEORETICAL SUBGROUPS

	High Warmth		Low Warmth	
	Democracy		Democracy	
	High Democracy	Low Democracy	High Democracy	Low Democracy
High Indulgence	15	5	1	9
Low Indulgence	10	0	8	8

The battery of rating scales used to describe nursery school behavior in this study has not been published as yet. Therefore, the following short description is included. The battery includes 45 variables as listed in Table 1 (pages 50-51). There is within the battery a hierarchy of generalization. The behavior of the child is first described in three main variables: 1, Interaction with contemporaries; 10.1, Interaction with adults; 11.1, Object-centeredness. These three variables describe roughly how the child's time and interest is divided among those three kinds of situations. Under each of these main variables, there are descriptive variables describing the nature of his activity in more detail. Thus under 1, Social Interaction are: 3.1, Friendly play, 3.2, Fighting. Under 3.2, Fighting, are the various variables 4.1, 4.2, etc. describing various sorts of child-to-child relations involving aggression.

The meaning of various patterns of ratings on this battery has not been nearly as well explored as have the patterns of parent behavior. The various patterns presented in this report must, therefore, be interpreted in terms of general knowledge of personality as described by the scales rather than in terms of extensive experience with the specific meanings of this particular battery.

RESULTS

The means and standard deviations for each of the six subgroups are shown in Table 1. The analysis of the data in a complex design of this sort may be carried out in a variety of ways, but it is preferable to determine the method of analysis ahead of time. In the present research, the selection of the groups was made in order to test the effect of the three main factors upon nursery school behavior, namely, warmth, democracy and indulgence. If the number of cases in each cell could have been controlled, the analysis would have been straight-forward. As it was, however, the correlations between the three variables that exist in the population appeared in

the unequal frequency of cases in the various subgroups. Consequently, the three main effects are interdependent, and cannot be tested independently of each other. This may be illustrated in the test of the effect of democracy. The subgroups high on democracy may be compared with the subgroups low on democracy, but the high democracy groups contain more cases which are also high on warmth than do the low democracy groups. Similarly, the high democracy groups contain fewer cases also high on indulgence than the low democracy groups. It is not possible to test democracy, uncontaminated by indulgence or warmth.

It is possible, however, to make statistically valid tests of a variety of hypotheses. These will be described in terms of analysis of variance.

1. The total variance may be analyzed into two portions: one estimating the variance within subgroups, the other the variance between subgroups. These two estimates are independent of each other and their ratio may be tested by means of the usual F test. Such a procedure tests the null hypothesis that the six subgroups are random samples from the same population. The variance between subgroups contains 5 degrees of freedom, the variance within subgroups contains 49 degrees of freedom as outlined in Figure II showing the actual values for variables 12.2, Dramatic play.

FIGURE II

ANALYSIS OF VARIANCE (STEP 1)
SEPARATION OF TOTAL SUM OF SQUARES INTO TWO COMPONENTS

	DF	Sum Squares	Variance	
Between subgroups	5	675.70	135.14	F=1.59
Within subgroups (error)	49	4156.41	84.82	
TOTAL	54	4832.11		

This total sum of squares between groups (675.70 in Figure II) contains the sum of squares attributable to any comparison of one set of subgroup means with another set. It is conceivable that some such comparison, i.e. some single degree of freedom, might be associated with that total sum of squares, but no comparison could lead to a larger sum of squares. If, therefore, the total sum of squares is so small that it would not be significant, even if there were only one degree of freedom associated with it, then there is no possibility of finding any significant difference by searching for the proper comparison among the subgroup means. To use variable 12.2 as an example, the sum of squares between groups is 675.70. If this were associated with only one degree of freedom, the variance would be 675.70. By comparison with an error variance of 84.82, F would be 7.9, a significant value. Child behavior variables for which the sum of squares between groups is so small are, therefore, eliminated from further statistical treatment.

For the remaining variables, there *may* be some significant differences among the various subgroups. The tests to be applied should be determined ahead of time, however, in order to avoid capitalizing upon chance differences which might exist.

2. The next step in the statistical treatment is to analyze the variance between groups into two components. One is attributable to the combined independent effects of warmth, democracy and indulgence; the other is due to interactions. This analysis is accomplished by testing the following hypothesis: The mean for any subgroup may be predicted by summating the following effects: (a) an effect due to warmth, whose value depends on whether the subgroup is warm or not warm, (b) plus an effect due to democracy, (c) plus an effect due to indulgence, (d) plus a general effect which is the same for six groups. The precise values of these four effects may be determined in such a way that the best possible fit to the data according to the criterion of least squares is effected.

For variable 12.2, Dramatic play, for example, the values of the effects are as follows:

(a) If a group is high on warmth, the best estimate of its effect is —1.88; if a group is low on warmth, its effect is +1.88.

(b) For democracy, the effect is +4.11 for high democracy; —4.11 for low democracy.

(c) For indulgence, the effect is .91 or —.91 depending upon whether the indulgence is high or low.

(d) The general effect is 25.97.

The predicted value of the mean of the subgroup which is high on warmth, democracy and indulgence, may be calculated according to this hypothesis, viz. (—1.88) + (4.11) + (.91) + (25.97) = 29.11. The actual value is 27.93. For the other five subgroup means, the prediction can be arrived at similarly. Figure III shows the predicted and actual values.

FIGURE III

PREDICTED AND OBTAINED VALUES FOR THE SIX SUBGROUPS MEANS FOR VARIABLE 12.2

Description of Subgroup				
Warmth	Democracy	Indulgence	Predicted Value	Actual Value
H	H	H	29.11	27.93
H	L	H	20.89	21.60
H	H	L	27.29	28.70
L	L	H	24.65	26.22
L	H	L	31.05	31.50
L	L	L	22.83	20.62

The variance of these predicted subgroup means estimates the total variance due to the independent effects of the three factors and is associated with three degrees of freedom. The remainder, when that variance is subtracted from the total variance between subgroups, estimates the accuracy of the fit of the hypothesis and is associated with two degrees of freedom. If this residual variance is significant when compared to the error variance, the hypothesis is demonstrated to be inadequate and there must be special effects accompanying particular combinations of the factors which cannot be accounted for by treating them as independent and additive. In other words, there is interaction. For only two of the variables in this study was there a significant interaction, 13.2, Questioning and 14.1, Vigor of activity. The data for variable 12.2 is shown in Figure IV.

FIGURE IV

ANALYSIS OF VARIANCE (STEP 2)
SEPARATION OF SUM OF SQUARES BETWEEN GROUPS INTO TWO COMPONENTS

	DF	Sum Squares	Variance		
Independent Variance	3	569.86	189.95	F=2.24	(by Comparison
Interaction Variance	2	105.84	52.92	F= .62	with error, Figure II.)
Variance between Groups .	5	675.70			

3. If the interaction is not significant, then the hypothesis is taken to be adequate, and the analysis proceeds to the next step, the determination of the effect of the separate factors. One of the complications of analysis of variance when there are varying numbers of cases in each subgroup is that the estimation of the effect of each factor depends upon what other factors are being simultaneously estimated. For example, the values of the effects in variable 12.2 under different conditions are shown below.

If democracy alone is estimated, general effect is 26.13 and democracy is 2.99. If warmth and indulgence alone are estimated, general effect is 26.24, warmth .69, indulgence —.59. These values may be used to test the adequacy of various hypotheses. If democracy alone is estimated, the hypothesis being tested is that the subgroup means may be adequately predicted knowing a general effect and an effect of democracy. If the variance of such estimates is subtracted from the total variance due to all three factors acting independently, the adequacy of that hypothesis may be determined. If the residual variance under such conditions is insignificant, then it can be concluded that within the framework of the alternative hypothesis stated in this treatment, democracy is sufficient to account for the obtained data. Thus we have a test of the "sufficiency" of a factor.

Now if warmth and indulgence are estimated together, leaving out democracy, then the hypothesis is being tested that the subgroup means may

be predicted by means of warmth and indulgence alone. If the residual variance, measuring the adequacy of the fit, is insignificant, then the sufficiency of those two variables acting together is established. If, however, the residual variance is significant, then warmth and indulgence acting together are shown to be insufficient to account for the total variance due to all three factors. In other words, democracy is, within the framework of the stated alternatives, "necessary." The data for 12.2 is shown in Figure V.

FIGURE V

Analysis of Variance (Step 3)
The Tests for Necessity and Sufficiency

Test of Sufficiency of Democracy

	DF	Sum Squares	Variance	
Democracy	1	464.11		
Remainder	2	105.75	52.87	F= .62
Independent Variance	3	569.86		

Test of Necessity of Democracy

	DF	Sum Squares	
Warmth and Indulgence ...	2	35.52	
Remainder	1	534.34	F=6.30
Independent Variance		569.86	

There are certain logical relations among these findings. It is possible that two factors might both be "necessary" or they might both be "sufficient." It is impossible, however, for one factor to be sufficient, while another one is necessary. If, therefore, one variable is necessary and sufficient, no other variable can be either.

4. There is still another test which can be made. The significance of each factor can be tested, singly against the error variance. An estimate of its variance which is independent of the error variance can be found. Its variance as estimated under those conditions is not, however, independent of the variance of the other factor. It is possible for two variables to both be significant, while neither is necessary or sufficient. One factor may be significant while another is both necessary and sufficient, although this is an unlikely circumstance.

There are, therefore, three different sorts of tests for each of the factors warmth, democracy and indulgence, which may be applied to the data on each of the Child Behavior variables. These will be indicated in Table 2, as follows: Sig.—significant; Suff.—sufficient; Ness.—necessary; N+S necessary and sufficient. Table 2 includes for each variable, the values of the

three effects estimated simultaneously as described in Step 2 and a statement of the significance of each factor. The +, or —, beside each statement of the significance is taken for the first half of the table and shows the direction of the effect.

Before concluding this section of statistical description, it would be wise to indicate once more that these terms, necessity and sufficiency, are applicable within a particular framework of alternative hypotheses. The statement that democracy is a necessary and sufficient variable in accounting for the data on 12.2, Dramatic play can be expanded into the following form which states all the restrictions upon that statement. Among the alternative variables, warmth, democracy and indulgence, which together adequately predict the subgroup means, the variable democracy is sufficient to predict those means with a statistically insignificant remainder, and it is impossible to predict those means with a statistically insignificant remainder by means of any one alternative variable or by any combination of the alternative variables.

The clear cut result of this analysis is that democracy is by far the most important of the three factors in terms of accounting for the variability of the various subgroup means. Those variables which show significant effects of democracy in the home seem to reflect three sorts of consequences of democracy. First, children in the Fels population who are raised democratically seem to be rated higher on behavior reflecting an active, socially outgoing type of activity, the hostile and domineering kinds of activity as well as the friendly kinds. Second, children from democratic homes are in a favored position in the groups to which they belong. Their aggression and bossing is on the whole successful, and they are not likely to have inferior status in the group. Third, children from democratic homes are generally rated high on activities demanding intellectual curiosity, originality and constructiveness.

The effects of indulgence are generally opposite to those of democracy, but indulgence has specific effects on two interrelated variables of child behavior: physical apprehension, and lack of skill in muscle activities.

These results generally confirm the findings presented in the previous publication as well as the statement of many other writers who have discussed the parent-child relationship. In nursery school, the most striking differences among children may be seen in their activity level, and self-assertiveness. The immature, shy child and the anxiety-ridden apprehensive child together form a group which is in sharp contrast with the active, curious child who participates fully in social activities. The differences between the socially immature child and the apprehensive child are not nearly as obvious or clear cut.

Democratic parents encourage free exploration and experimentation, thus providing intellectual stimulation with a minimum of infantilization. Such a democratic environment can, of course, be so lacking in emotional

TABLE 2

EFFECT AND SIGNIFICANCE OF PARENTAL FACTORS ON CHILD BEHAVIOR

Variable	*Warm*	*Democ.*	*Indul.*	*Gener.*	*Warm*	*Democ.*	*Indul.*	*Int.*
1 Social Interaction	— .94	2.17	— .35	26.98	.....	Sig.+	.....	...
2.1 Exploratory Contacts	1.28	—2.83	— .38	14.20	.....	N+S−	.....	...
3.1 Friendly Play	.37	2.06	— .90	25.82	.....	Suff.+	.....	...
3.2 Fighting	— .89	1.40	.11	23.56	.....	.....	.....	...
4.1 Aggression	—1.50	2.49	— .03	22.59	.....	.....	.....	...
4.2 Success of Aggression	— .19	2.96	—1.07	21.01	.....	N+S+	.....	...
4.3 Receiving Aggression	—1.58	.72	.51	22.90	.....	.....	.....	...
4.4 Resisting Aggression	— .62	1.22	1.08	22.04	.....	.....	.....	...
5.1 Seeking Alliance	.21	2.72	— .77	23.46	.....	Suff.+	.....	...
5.2 Success of Approaches	— .31	3.07	— .43	25.47	.....	Suff.+	.....	...
5.3 Approaches Rejected	—1.22	— .75	1.03	20.08	.....	.....	.....	...
5.4 Receiving Alliance	— .69	3.68	— .74	23.18	.....	N+S+	.....	...
5.5 Accepting Alliance	.84	2.15	— .72	25.53	.....	Suff.+	.....	...
5.6 Rejecting Alliance	1.27	— .73	— .30	19.05	.....	.....	.....	...
6.1 Bossing	— .18	3.61	— .22	23.62	.....	N+S+	.....	...
6.2 Success of Bossing	— .64	4.26	—1.88	21.60	.....	N+S+	.....	...
6.3 Receiving Bossing	— .34	.02	1.48	25.20	.....	.....	.....	...
6.4 Accepting Bossing	— .81	— .53	1.23	24.78	.....	.....	.....	...
7.1 Receiving Attention	— .27	2.74	— .46	23.26	.....	N+S+	.....	...
7.2 Avoiding Attention	2.75	—4.25	.88	22.15	.....	N+S−	.....	...
7.3 Seeking Attention	—1.30	2.12	.73	24.34	.....	.....	.....	...
8.1 Inferiority Status	1.15	—2.62	1.12	25.16	.....	N+S−	.....	...
8.2 Protesting Inferiority	—1.64	3.31	— .05	25.38	.....	N+S+	.....	...
9.1 Offering Help	.30	— .30	.57	22.71	.....	.....	.....	...
9.2 Success of Offers	.60	— .41	— .84	21.42	.....	.....	.....	...
9.3 Receiving Help	— .59	.70	.06	23.00	.....	.....	.....	...
9.4 Asking Help	1.37	—1.88	.30	27.38	.....	Suff.−	.....	...
10.1 Interaction with Adults	.29	— .02	.79	26.79	.....	.....	.....	...
10.2 Friendly Overtures	.84	.17	.32	22.95	.....	.....	.....	...
10.3 Asking Adult Help	—1.01	.87	.89	25.71	.....	.....	.....	...
10.4 Adult Interference	— .45	— .01	— .26	24.64	.....	.....	.....	...
10.5 Resisting Interference	— .69	.70	— .76	23.35	.....	.....	.....	...
11.1 Object-Centeredness	—1.08	.56	.42	25.72	.....	.....	.....	...
11.2 Acquisitiveness	— .79	1.69	— .66	27.39	.....	.....	.....	...
11.3 Orderliness	1.94	— .53	1.35	35.93	Sig.+	.....	Sig.+	...
11.4 Constructiveness	—2.34	3.54	— .23	25.83	.....	N+S+	.....	...
12.1 Imitation	.93	—3.36	.50	26.78	.....	N+S−	.....	...
12.2 Dramatic Play	—1.88	4.11	.91	25.97	.....	N+S+	.....	...
13.1 Expostulation	—1.55	3.09	.23	25.57	.....	Suff.+	.....	...
13.2 Questioning	—2.19	3.81	— .99	28.38	.....	N+S+	.....	Sig.
14.1 Vigor of Activity	—1.52	2.13	—2.09	27.37	.....	Sig.+	Sig.−	Sig.
14.2 Large Muscle Skill	— .04	1.86	—1.97	30.92	.....	Sig.+	Sig.−	...
14.3 Small Muscle Skill	— .17	2.66	—1.12	28.20	.....	Suff.+	.....	...
14.4 Physical Apprehension	— .20	— .91	3.50	24.57	.....	.....	N+S+	...
15.1 Social Apprehension	.60	—1.71	1.74	24.23	.....	.....	.....	...

support that the freedom and stimulation only provoke anxiety, but most democratic homes are warm and do provide emotional support. The child, therefore, works out the anxiety which new situations evoke under the protection of a sympathetic yet encouraging mother. Democracy thus tends to develop active participation in a nursery school play situation, as shown by the clear importance of democracy in the statistical analysis.

It would not be accurate to ignore other characteristics of the democratic home which probably play a role in these findings. Democratic parents and their children generally have an I.Q. which is higher than other types of parents and their children. The greater creativity, imaginativeness and constructiveness of children from democratic homes is certainly related to the intelligence of those children. On the other hand, there is evidence that a democratic home stimulates the I.Q. so the exact role of intelligence is difficult to appraise. Another factor might be considered an artifact. One of the ways democratic parents in the Fels study provide their encouragement of the child is by sending them to nursery school. The children of democratic parents in this study had more nursery school experience outside of the Fels situation than did children from other kinds of homes. Again it is difficult to determine the role of the nursery school experience. The point is that democracy in the home is not operating merely during the time the parent and child are together. It is a general characteristic which tends to shape all of the child's environment into a general pattern. It is by way of such environmental factors that the democratic philosophy of the parent has its effect on the child.

To summarize the statistical analysis, democracy has been shown to have a large number of important effects upon nursery school behavior; particularly, it encourages free and active participation in nursery school activities, it makes successful aggression and self assertion more likely and it promotes creative and constructive behavior. Indulgence has specific effects of making the child physically apprehensive and inhibiting the development of large muscle skill.

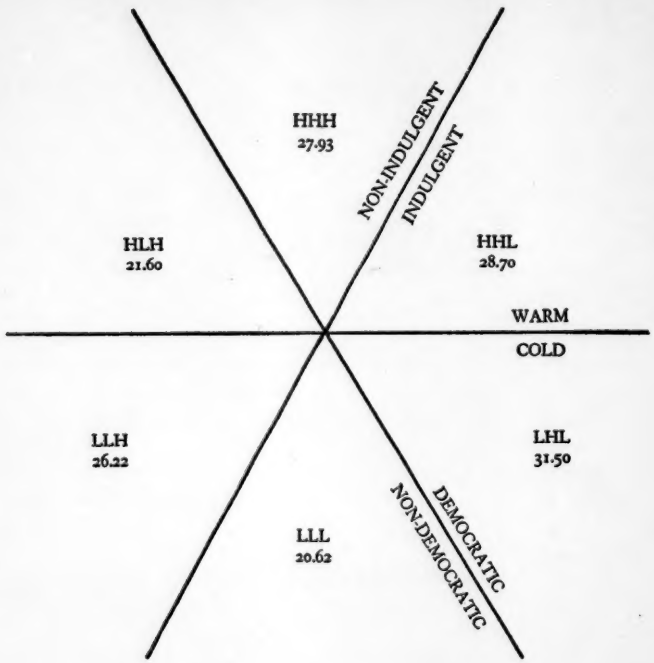
The report might end at this point with the acceptance of these findings at their face value. To do so, however, would, in the author's opinion, ignore certain aspects of the data which are very provocative of further research. The subgroup means on variable 12.2, Dramatic play, can again be used for illustration (Fig. VI). If the groups are designated by the various combinations of H and L as in Table 1, where the factors are listed in the order, warmth, democracy, indulgence, the data can be conveniently arranged in the form of a hexagon.

The three groups above the middle are warm, the three below are cold. The three groups to the right of the democratic axis are democratic, the three to the left are non-democratic. The three groups to the left of the indulgence axis are indulgent, the three to the right are non-indulgent.

It will be noticed that among the warm groups, the means increase from

FIGURE VI

MEANS OF 12.2, DRAMATIC PLAY IN EACH SUBGROUP



left to right. There is a progression from high indulgence, low democracy through high indulgence, high democracy to low indulgence, high democracy. Among the cold groups, however, the LLL group, low on all three factors is lowest, the high indulgent group next and the high democracy group highest. This general pattern of group means is found very frequently, particularly in those variables for which the statistical analysis shows that democracy is the important factor. The consistency with which this pattern appears seems to suggest that the mere statement that democracy is the important factor misses something. One hypothesis which is suggested is that the two groups with the lowest means are hampered by different factors. A study of the parent ratings confirms that suspicion. The LLL group is marked by a drastically low level of intellectual stimulation but by only moderate levels of restrictiveness. Restrictiveness of regulations, quantity of suggestion and criticism, babying and protectiveness, in short,

all the different varieties of limitations upon the child's freedom, are lower in the LLL group than in either of the indulgent groups (LLH or HLH). Furthermore, some consequences of this difference can be seen in the ratings of nursery school behavior although not strikingly. On the variables describing intellectual constructiveness, dramatic play, non-imitation and the like, it is the LLL group which has the lowest rating of any. On variables describing apprehensiveness, especially physical fearfulness and physical skill, and those describing social aggressiveness, it is the HLH group which is rated lowest.

This suggests that a different kind of analysis might reveal more information than did the one employed in this report, that the original groupings of cases might better be made on the basis of restrictiveness and intellectual stimulation than on the basis of democracy alone.

There is one serious difficulty to such an analysis, however. That is the behavior of the LLH group, low on warmth, high on indulgence and low on democracy. In terms of the treatment of these children in the home, they would be predicted to be the most hampered of any, because they are almost as restricted as the HLH group and received almost as little intellectual stimulation as the LLL group. Instead of being rated the lowest on the child behavior scales measuring active participation, they received ratings which are higher than either of the other non-democratic groups. For this fact, the author has no explanation worthy of the name.

The obvious answer to the questions provoked by these divergences of the data from the simple hypothesis that democracy in the home produces widespread evidence of active participation in free play activities, is another research project. It should involve more cases and should be designed to test some of the hypotheses that inspection of these data has suggested.

All such questions deal with a refinement of the hypotheses tested in the present study; they do not contradict it. This study and the previous one confirm each other, leading to the conclusion that the effect of the democratic home as contrasted to the non-democratic one is to stimulate the child in such a way that he is more actively engaged in peer-centered activities, that he is more successful in those activities, and that he is better able to contribute original creative ideas to the groups with which he interacts.

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AN ACOUSTICAL STUDY OF VOCAL PITCH IN SEVEN- AND EIGHT-YEAR-OLD BOYS

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The collection of information concerning the voices of pre-adolescent male children was the general objective of the present study. The specific populations sampled were boys aged seven and eight chronological years. One vocal attribute, pitch, was studied by means of acoustical measurement of the fundamental frequencies of the voices of the subjects. A companion study of girls at the same age levels will be reported separately, as will similar studies involving duration measurements.

Changes in vocal pitch during childhood, especially during infancy and adolescence, are marked. Two phenomena, pitch level and "voice breaks,"[1] are of particular interest because of their relationship to anatomical and physiological changes in the laryngeal region. The pitch level of the male child is known to descend over a wide interval from infancy to adulthood; the approximate extent of this interval may be gauged by comparing the results of *Fairbanks* (3) and *Pronovost* (7). Data which would permit a complete plot of the changes in pitch level as a function of age are not, however, available. The present study provides two additional plotting points for such a curve.

With respect to voice breaks, a study by *Curry* (2) reported the finding that a pre-adolescent control group of ten-year-old boys presented almost as many voice breaks as did the basic subjects, a group of mid-adolescent fourteen-year-old boys,[2] but the study was not designed to present data on this important, fundamental question: Are voice breaks at age ten advanced signs of beginning adolescence, or are they typical phenomena in the voices of pre-adolescent males generally? The present study was motivated in part by the need to investigate this problem with a group of boys even further removed from mid-adolescence. Finally, it was a purpose of this study to make inter-comparisons of the two groups of subjects with respect to these and other vocal pitch phenomena.

[1] Acoustically characterized by abrupt changes in fundamental frequency, usually from wave to wave, either upward or downward, typically of one octave in extent, and differing thus from the common inflectional changes of speech (4).

[2] The eighteen-year-old post-adolescent subjects presented no voice breaks.

Procedure

From the population of second- and third-grade boys enrolled in three public elementary schools two groups of 15 subjects each were chosen. Selection was at random except for sex and age. The latter was controlled to within plus or minus two months of 84 and 96 months, respectively. Group means and ranges for age, height, and weight are presented in Table I. The mean heights and weights are very close to the values of *Meredith* (6) for the ages in question. All subjects were able to read the test materials with ease, and no subject possessed any speech atypicality worthy of remark.

The following test passage was employed with all subjects.

Jane is a girl.
Jack is a boy.
They live on a farm.
Jack and Jane
have a big, black dog.
His name is Tip.
Jack and Jane like to play.
They play with Tip.
Tip likes to play ball.
Jack throws the ball to Tip.
Tip runs and catches it.
He brings the ball to Jack.
Then Jane throws the ball
back to Tip.
Mother calls Jack and Jane.
They call Tip,
and go into the house.

The passage was constructed from words used in standard primers, and was designed to be simple enough to be read by second-grade children without great difficulty. During construction it was repeatedly checked for reading level with a number of children. The passage was set up in primer type for use in the experiment, the paragraphing and line lengths being as shown above.

Each subject was brought into the laboratory individually for a high-quality phonograph recording of his oral reading of the test passage. Before the recording the subject practiced the passage both silently and aloud, and was assisted if any words were substituted, omitted, or mispronounced. He then read the passage aloud twice in succession, the second reading

TABLE I

AGE, HEIGHT, AND WEIGHT OF EXPERIMENTAL GROUPS

	Seven-Year-Old Group (N=15)	*Eight-Year-Old Group (N=15)*
Age (months)		
Mean	84	96
Range	82–86	94–97
Height (inches)		
Mean	49	51
Range	44–57	47–57
Weight (pounds)		
Mean	56	61
Range	42–82	50–81

being recorded. No subject was informed that a phonograph recording was being made, and none showed evidence of fear.

The second and third paragraphs of the test passage ("Jack . . . Tip." and "Tip . . . Tip."), 52 words in total length, were subjected to phonophotography and frequency measurement by means of an oscillographic device designed for the purpose (1). Pitch curves were plotted and the measurements described below were made. Each voice break in the records underwent separate examination by means of careful wave-to-wave measurements.

TABLE II

PITCH LEVEL AND NUMBERS OF VOICE BREAKS

	Seven-Year-Old Group (N=15)		*Eight-Year-Old Group (N=15)*			
	AM	*SD*	*AM*	*SD*	*Diff.*[1]	*t*[2]
Pitch Level						
Cycles per Second	294		297			
Tones above 16.35 cps	25.0	1.1	25.1	1.0	0.1	0.244
Number of Voice Breaks						
Downward	1.7	2.7	1.7	2.1	0.0	
Upward	2.1	2.5	2.0	3.4	—0.1	0.089
Total	3.8	4.4	3.7	5.3	—0.1	0.054

[1] $M_8 - M_7$

[2] *t*, 1 per cent, 2.763; *t*, 5 per cent, 2.048

Results

Pitch Level and Voice Breaks. Of focal interest are the measurements shown in Tables II and III. Table II presents data on pitch level and the number of voice breaks. It is seen that the mean pitch levels of the seven- and eight-year-old groups are, respectively, 294 and 297 cycles per second, or, as given in the second line, 25.0 and 25.1 musical tones above the zero reference frequency of 16.35 cps (5). The first of these values, 25.0 tones, is the level of D_4 on the musical scale,[3] or one musical tone above Middle C. The difference of 0.1 tone is not statistically significant. Comparable

TABLE III

Extents, Upper Limits, and Lower Limits of Voice Breaks

	Seven-Year-Old Group		*Eight-Year-Old Group*	
	N	*AM*	*N*	*AM*
Extent (tones)				
Downward Voice Breaks	25	6.6	25	5.9
Upward Voice Breaks	32	6.0	30	6.1
Total Voice Breaks	57	6.2	55	6.0
Upper Limit (tones above 16.35 cps)				
Downward Voice Breaks	25	26.1	25	24.6
Upward Voice Breaks	32	25.6	30	25.1
Lower Limit (tones above 16.35 cps)				
Downward Voice Breaks	25	19.5	25	18.8
Upward Voice Breaks	32	19.7	30	19.1

values for ten-year-old boys from *Curry* (2) are a median of 24.4 tones above 16.35 cps and a corresponding frequency of 270 cps, approximately one semitone lower than the means of the present study. Fourteen-year-old boys, with a median of 23.4 tones above 16.35 cps, were approximately one and one-half musical tones lower than the subjects of the present study. This similarity of pitch level over the age range of seven years is notable. In contrast, obtained median pitch levels for eighteen-year-old subjects (2) and adult males (7) were in the neighborhood of C_3.

The balance of Table II pertains to the number of voice breaks. The means of 3.8 and 3.7 total voice breaks at ages seven and eight, respectively, may be thought of as indicating an approximate average frequency of occur-

[3] The subscript system used is that suggested by *Young* (8); the zero reference frequency, 16.35 cps, is C_0 on a scale where A_4 is 440 cps; Middle C, four octaves higher than the reference, is denoted as C_4.

rence of one break every 14 words in this 52-word passage. This is comparable to the ten- and fourteen-year-old boys (2), whose means of 3.3 and 4.2, respectively, occurred during reading of a 55-word passage. Table II also reveals no significant differences between the groups with respect to number of voice breaks.

Table III is concerned with the extents of the voice breaks and with the locations of their upper and lower limits. For purposes of these calculations the breaks for all subjects within each group were pooled, the numbers concerned being given within the body of the table. The data show mean extents in close approximation to one octave (= 6.0 tones) in all instances, as previously reported for older children (2). The upper limits of both downward and upward voice breaks are seen to be close to the mean pitch levels shown in Table II, while the mean lower limits of the breaks are approximately one octave lower, near the pitch level for adult males. The voice breaks, in other words, whether downward or upward, occurred in the lower halves of the pitch ranges of the subjects, and jumped the interval between childhood and adult male pitch levels.

Pitch Variability. Table IV is concerned with certain standard measures of pitch variability, namely, range, inflections, and shifts.[4] The values are very similar to those reported in other studies of children and adults (2, 4, 7), the only differences seemingly worthy of comment being in the 90 per cent pitch range.[5] In this measure the values are similar to those for ten-year-old boys, but somewhat smaller than for older subjects, and the comparative monotony of pitch was perceptible in the phonograph recordings. It is conjectured that this reduced variability is not characteristic of the *speaking* voices of children, but may well be typical of their oral reading during the early grades.

The data of Table IV show no significant differences between the two age levels here sampled. While it is not contended that the study presents exhaustive measurements of pitch variability, the finding is noteworthy. Measurable vocal differences, related to oral reading ability, would be expected. Such differences were clearly to be heard in the recordings, but were most obvious in rate, duration, etc. Measurements of these and other temporal characteristics, showing substantial differences, will be reported later.

[4] "The *total pitch range* is the difference between the highest and lowest fundamental frequencies measured in a given sample and is expressed ... in tones ... an *inflection* is defined as a frequency modulation, either upward or downward, without interruption of phonation, while the term *shift* refers to a change in pitch which takes place between the terminal pitch of a given phonation and the initial pitch of the subsequent phonation." (4)

[5] The range between the 95th and 5th percentiles of the frequency distribution of pitches used; it is expressed in tones.

TABLE IV

MEASURES OF PITCH VARIABILITY. ALL VALUES IN MUSICAL TONES

	Seven-Year-Old Group (N=15)		*Eight-Year-Old Group (N=15)*			
	AM	*SD*	*AM*	*SD*	*Diff.*[1]	*t*[2]
Total Pitch Range	9.8	3.3	9.7	4.0	—0.1	0.073
90 per cent Pitch Range[3]	3.6	0.9	3.9	1.4	0.3	0.682
Extent of Inflections						
Downward	1.8	0.4	1.9	0.5	0.1	0.588
Upward	1.5	0.3	1.5	0.4	0.0	
Total	1.7	0.3	1.7	0.4	0.0	
Extent of Pitch Shifts						
Downward	1.8	0.6	1.5	1.1	—0.3	0.857
Upward	2.2	0.7	2.3	0.8	0.1	0.357
Total	2.0	0.5	2.0	0.8	0.0	

[1] $M_8 - M_7$

[2] *t*, 1 per cent, 2.763; *t*, 5 per cent, 2.048

[3] 95th percentile — 5th percentile

SUMMARY

Two groups of male subjects were selected at random except for age. The first group consisted of 15 seven-year-old boys, ranging in chronological age from 82 to 86 months with a mean of 84 months; the other group consisted of 15 eight-year-old boys, ranging in chronological age from 94 to 97 months with a mean of 96 months. Under laboratory conditions the subjects read aloud a 52-word primary-level test passage; phonograph recordings were made and subjected to phonophotography and frequency measurement. Data on vocal pitch thus were collected, with the following results:

1. Pitch levels for both groups were similar to those of boys at ages 10 and 14, being close to Middle C and approximately one octave above the commonly reported levels for adult males.

2. Voice breaks, similar to those of older boys in number, extent, and location, were found in both groups, appearing to indicate that these phenomena are not to be attributed exclusively to adolescence.

3. Measures of pitch variability such as pitch range, extent of inflections, and extent of pitch shifts showed the two groups to be similar in these respects to older children.

4. Differences between the two experimental groups were not statistically significant.

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AN ACOUSTICAL STUDY OF VOCAL PITCH IN SEVEN- AND EIGHT-YEAR-OLD GIRLS

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The present study is a companion to that of *Fairbanks, Wiley, and Lassman* (3), who studied the vocal pitch of seven- and eight-year-old boys, and differs only in the sex of the subjects. Changes in the vocal pitch of the female during early life undoubtedly take place, but the extent of the changes, although presumably much smaller than in the male, has not been investigated. As a matter of fact, unlike the situation in studies of male voice, the literature provides no satisfactory information regarding vocal pitch in average females at any age level. The present study, probably for the first time, presents acoustical data on the vocal pitch of girls.

The pitch level of speech, because of its relationship to growth of the larynx, is of major interest, and this study is the first in a program of acoustical investigations designed to permit the plotting of a curve of pitch level as a function of age in the female. Comparable curves for males and females will differ greatly from adolescence on, but the differences or similarities during pre-adolescent years are not to be predicted on the basis of present information. The present study, taken in conjunction with its companion (3), begins to throw some light in this direction.

Voice breaks in the male adolescent are phenomena of common experience, and have been studied acoustically by *Curry* (1), and by *Fairbanks, Wiley, and Lassman* (3). In the former study a group of ten-year-old pre-adolescent controls were found to have voice breaks similar to those of mid-adolescent subjects. In the latter investigation boys aged seven and eight presented similar voice breaks, a finding which suggests that the phenomena are characteristic of male children generally, and are not unique to adolescence. The present study afforded an opportunity to test the additional hypothesis that voice breaks are not sex-linked. Finally, it was a purpose of the study to compare the two experimental groups.

PROCEDURE

Since its experimental design was identical with that of the companion study of boys (3), the procedure of the present study will not be described in detail and may be summarized as follows.

Two groups of 15 female subjects each were chosen from the public schools, selection being at random except for sex and age. Age was controlled within the limits shown in Table I, which also presents measurements of height and weight, the means being very similar to those of *Meredith* (5). The subjects, individually, read aloud a specially constructed, 52-word, primary-level test passage, which was presented as the central portion

TABLE I

AGE, HEIGHT, AND WEIGHT OF EXPERIMENTAL GROUPS

	Seven-Year-Old Group ($N=15$)	*Eight-Year-Old Group* ($N=15$)
Age (months)		
Mean	84	95
Range	82–86	93–97
Height (inches)		
Mean	50	53
Range	45–64	50–58
Weight (pounds)		
Mean	56	60
Range	40–134	46–75

of a longer passage, and was easily read by all subjects. Phonograph recordings were made, and subjected to phonophotography and frequency measurement. Each voice break was examined with elaborate care by means of wave-to-wave measurement.

RESULTS

Pitch Level. The first portion of Table II presents the data on pitch level. The means of 24.6 and 24.8 tones above the zero reference frequency of 16.35 cps (4) are translated into the more usual expression of frequency in the first line. The difference of 0.2 tone, it is seen, is not statistically significant. Comparable values (3, 1) for boys aged seven, eight, 10, and 14, respectively, are 25.0, 25.1, 24.4, and 23.4 tones above 16.35 cps. All six means are within a 1.7 tone range and approximate Middle C (24.0 tones above 16.35 cps). *Murray and Tiffin* (6) report means for groups of women with poor, good, and trained voices of 23.7, 23.3, and 23.8 tones above 16.35 cps, respectively, while *Snidecor's* (9) values for rigidly selected superior female speakers were approximately two tones below Middle C.

Adult males (8) and eighteen-year-old boys (1), on the other hand, have been reported with means close to 18 tones above 16.35 cps, or around one octave lower. In summary, the pitch levels of the two groups in the present study do not differ from each other, are similar to those of boys of their own age, to those of older boys up to age 14, and to those of adult females, and are higher by approximately one octave than those of mature males.

TABLE II

PITCH LEVEL AND NUMBERS OF VOICE BREAKS

	Seven-Year-Old Group ($N=15$)		*Eight-Year-Old Group* ($N=15$)			
	AM	*SD*	*AM*	*SD*	*Diff.*[1]	t[2]
Pitch Level						
Cycles per Second	281		288			
Tones above 16.35 cps	24.6	1.0	24.8	1.4	0.2	0.426
Number of Voice Breaks						
Downward	1.6	2.6	1.7	1.4	0.1	0.125
Upward	1.5	2.0	1.7	1.7	0.2	0.282
Total	3.1	4.4	3.4	2.9	0.3	0.211

[1] $M_8 - M_7$

[2] t, 1 per cent, 2.763; t, 5 per cent, 2.048

Voice Breaks. Probably the most important finding of the study, certainly unexpected by the experimenters, was the occurrence of voice breaks. The lower portion of Table II shows means of 3.1 and 3.4 voice breaks for the two groups, each divided about equally between downward and upward breaks. None of the differences is statistically significant. In the companion study of boys reading the same passage means of 3.8 and 3.7 total voice breaks were found, while boys at ages 10 and 14 have been reported with means of 3.3 and 4.2, respectively, in a passage of roughly comparable length.

The voice breaks in the present study, although not obtrusive, were clearly audible in the phonograph recordings, and the oscillographic records were verified by impartial individuals expert in acoustical measurement of speech. Since the phenomena were found in the studies cited, but not in studies of eighteen-year-old boys (1), adult males (8), and adult females (9) which employed identical phonographic instrumentation and measurement procedures, the possibility that the voice breaks were artifacts of apparatus or procedure appears unlikely.

Fairbanks, Wiley, and Lassman (3), having found voice breaks in pre-adolescent boys, concluded that they "... are not to be attributed exclusively to adolescence." The findings of the present study appear to warrant the additional conclusion that voice breaks are not restricted to male children. Taken as a whole, the data of the various studies cited indicate that voice breaks are non-sex-linked phenomena of childhood which typically disappear prior to establishment of adult vocal habits.

TABLE III

EXTENTS, UPPER LIMITS, AND LOWER LIMITS OF VOICE BREAKS

	Seven-Year-Old Group		*Eight-Year-Old Group*	
	N	*AM*	*N*	*AM*
Extent (tones)				
Downward Voice Breaks	24	5.7	26	6.5
Upward Voice Breaks	23	6.0	25	6.4
Total Voice Breaks	47	5.8	51	6.5
Upper Limit (tones above 16.35 cps)				
Downward Voice Breaks	24	24.2	26	23.0
Upward Voice Breaks	23	24.5	25	24.3
Lower Limit (tones above 16.35 cps)				
Downward Voice Breaks	24	19.5	26	16.5
Upward Voice Breaks	23	18.5	25	17.4

For the means presented in Table III the voice breaks were pooled within each age group of 15 subjects, *N* varying thus as shown for downward, upward, and total voice breaks. The mean extents are seen to be in the neighborhood of six tones, or one octave, agreeing generally with previous findings with male subjects (1, 3). Although neither the acoustical nor the neurophysiological bases for voice breaks can be satisfactorily explained as yet, extents of this order may probably be regarded as characteristic in view of this repeated finding.

Table III is also concerned with the location of the upper and lower limits of voice breaks, *i.e.*, the levels from which and to which they take place. If the mean upper limits are compared to the mean pitch levels (Table II, line 2), the similarities will be noted, while the lower limits are distributed about the commonly reported pitch level for the adult male. In these respects also the present subjects resemble male children. *Curry* (1) offered the following explanation for this location in male adolescents:

"During ages when breaks are occurring, it is conceived that the laryngeal anatomy of the normal male is undergoing reorganization which will result in the establishment of a new vocal pitch level at the common level of adult male speech. . . . The breaks . . . are down to and up from the region of this adult pitch which probably is to be established in a few years for these subjects, and which adjustment may be assumed to be in progress at age fourteen. . . . it has been somewhat surprising to find a large number of breaks occurring at ten years." The immature female subjects of the present study obviously may not be regarded as undergoing laryngeal "reorganization" leading to the ultimate establishment of adult pitch levels in the region of the lower limits of their voice breaks (See above, *Pitch Level*, for pitch levels of women). This location defies explanation, although the hypothesis quoted above appears to be untenable. It seems clear, however, that the location of the lower limits of voice breaks may not be regarded as forecasting the ultimate location of the adult pitch level, and that there probably is no relationship between the two.

The finding of voice breaks in these various samples of pre-adolescent children poses a most intriguing question: Why, since Aristotle, have voice breaks been observed during and associated exclusively with male adolescence, and overlooked in the speech of younger children of both sexes? One explanation might be that they are more readily heard during male adolescence because they take on other acoustical characteristics, *e.g.*, concomitant intensity of wave composition changes. Although direct measurements of such other variables have not been made, oscillograms and recordings of voice breaks, however, indicate no obvious differential of this kind. A more likely speculation would seem to be that the answer to the question may be found in the relationship between the typical location of the breaks (commonly between 24 and 18 tones above 16.35 cps, or vice versa) and the *mode pitch level* of the individual in question. As long as the voice breaks are in the lower portion of the pitch range, down from and up to the mode, they tend to be overlooked as common phenomena of childhood, although they may be heard if the attempt is made. As the adolescent male pitch level lowers toward the adult male level, probably sometime between age 14 and age 18, and probably quite rapidly in most cases, the voice breaks, if they persist, are, after a time, found *above* rather than *below* the mode pitch level. With such a relationship to the mode they are then heard as anachronistic returns to the childhood level against a background of predominantly low pitched, male, quasi-adult phonation, and thus become more obvious to the listener.[1]

[1] *Pedrey* (7), in a non-instrumental study of the oral reading of boys aged 11 to 16, reported only four voice breaks as he listened to his 1014 subjects for a combined total of 84 hours. While this figure, secured from unrecorded and, hence, unrepeatable speech, observed subjectively by one listener, cannot be taken as a valid measure of the frequency of occurrence even of obvious voice breaks, it does suggest that they vary in their obtrusiveness, and are, on the whole, relatively unobtrusive.

Pitch Variability. In Table IV are shown data on measures of certain aspects of pitch variability.[2] These aspects are probably more closely linked to oral reading and speaking ability than to vocal development. In general, the means differ from those of other samples of children and adults (1, 2, 3, 8, 9) by amounts not worthy of remark, except in the case of the 90 per

TABLE IV

MEASURES OF PITCH VARIABILITY. ALL VALUES IN MUSICAL TONES

	Seven-Year-Old Group ($N=15$)		*Eight-Year-Old Group* ($N=15$)			
	AM	*SD*	*AM*	*SD*	*Diff.*[1]	t^2
Total Pitch Range	10.3	1.2	10.0	2.3	—0.3	0.429
90 per cent Pitch Range[3]	3.7	0.7	3.3	1.1	—0.4	1.212
Extent of Inflections						
Downward	1.7	0.03	1.8	0.4	0.1	0.714
Upward	1.4	0.3	1.5	0.4	0.1	0.714
Total	1.5	0.2	1.7	0.4	0.2	2.000
Extent of Pitch Shifts						
Downward	1.7	0.7	1.5	0.6	—0.2	0.800
Upward	2.2	0.5	1.9	0.4	—0.3	2.143
Total	2.0	0.5	1.7	0.4	—0.3	2.143

[1] $M_8 - M_7$

[2] t, 1 per cent, 2.763; t, 5 per cent, 2.048

[3] 95th percentile — 5th percentile

cent range. Here the values resemble those for children aged seven, eight, and ten, and are smaller than for older subjects. This restriction of 90 per cent of the pitches used to a relatively small range probably describes in part the impression of pitch monotony heard in the recordings. In this regard, the companion study of boys (3) observes that "... this reduced variability is not characteristic of the *speaking* voices of children, but may well be typical of their oral reading during the early grades." As will be

[2] "The *total pitch range* is the difference between the highest and lowest fundamental frequencies measured in a given sample and is expressed ... in tones ... an *inflection* is defined as a frequency modulation, either upward or downward, without interruption of phonation, while the term *shift* refers to a change in pitch which takes place between the terminal pitch of a given phonation and the initial pitch of the subsequent phonation." (2) The 90 per cent pitch range is "The range between the 95th and 5th percentiles of the frequency distribution of pitches used; it is expressed in tones." (3)

seen in Table IV, the differences between the means are small and, for the most part, not statistically significant. In the last two items of the table, extent of upward and total shifts, the differences are significant at the 5 per cent level, but are perplexing because of their direction.[3] In general, the phonograph recordings revealed differences in oral reading ability in favor of the older group. Data on the durational characteristics of the performances will be reported later, and will show large differences in the expected direction.

Summary

Two groups of female subjects, one consisting of 15 seven-year-old girls and the other of 15 eight-year-old girls, were selected at random except for age. Under laboratory conditions the subjects read aloud a 52-word primary-level test passage; phonograph recordings were made and subjected to phonophotography and frequency measurement, with the following results:

1. Pitch levels of both groups were located close to Middle C, thus being similar to those of adult females, and to those of boys at ages seven, eight, 10 and 14. The values were approximately one octave higher than similar values for mature males.

2. Voice breaks were found in both groups, comparable to those of male adolescents and pre-adolescents in frequency of occurrence, extent, and location, indicating that they are not exclusively sex-linked or adolescence-linked phenomena.

3. In such aspects of pitch variability as pitch range, extent of inflections, and extent of pitch shifts the two groups were similar to male children.

4. In all important respects the differences between the two groups were not statistically significant.

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AN INVESTIGATION OF ONE TOWN'S OPINION RELATIVE TO THE PROBLEMS OF CHILD GUIDANCE[1]

DAVID C. MURRAY

INTRODUCTION

In the early part of 1949 the Junior Chamber of Commerce of Sterling, Illinois contacted the Psychology Department of Northwestern University, inquiring about the probable cost of a short clinic on child guidance to be held in Sterling under the direction of one of the University professors. Upon arrangement of mutually satisfactory terms Dr. T. W. Richards, of the Northwestern Psychology Department, went to Sterling and held the proposed clinic from Tuesday, February 14, to Friday, February 17, 1949.

As held, this clinic consisted of twelve individual clinical interviews with twelve children, arranged through the school systems, spaced at one-hour intervals over the four mornings. During the afternoons and evenings, Dr. Richards addressed a large joint Parent-Teachers Association meeting, held four seminars for varied groups, and served as a moderator of a parent-teen-aged panel.

At Dr. Richards' suggestion, the author travelled to Sterling on March 23, 1949 and talked with various members of the Junior Chamber of Commerce and with the superintendent of the Sterling school system in an effort to gain some idea of the effect of the guidance clinic.

Everyone contacted had high regard for the work of Dr. Richards. Dissatisfaction with the general effect of the speeches and seminars was, however, evident. This is not surprising since such a clinic had, so far as is known, never previously been held in as small a town as Sterling.

Essential information had been unavailable. The town's knowledge of child psychology was unknown. Unknown, too, was the readiness of the population to accept and act upon current theories and information. No basis had existed upon which to determine the type of presentation best calculated to arouse interest and motivate personal utilization of approved principles of child rearing.

PURPOSE

The main problem here presented is one of methodology. It is desired to determine the optimal method; within normal financial and temporal limitations, of ascertaining the state of a town's opinion relative to certain problems of child rearing. Information is needed on the comparative readi-

[1] This material is based on a master's thesis carried on at Northwestern University. Acknowledgment is due to Dr. T. W. Richards for suggestion of the problem and criticism of the manuscript.

ness with which townspeople would turn to various outside agencies for aid with their children. Reliable answers are sought for questions about present willingness to accept aid and advice from psychologists, and about present demand for the full-time services of a child psychologist or psychological agency. An estimation is sought of the effect on a town's entire population of a four-day child guidance clinic held there.

The purpose of this research, then, was to develop a method of determining a town's opinion on such a subject as child guidance. In the process it was hoped to utilize the method developed to make a preliminary report upon town opinion about ways of dealing with problem children; the desirability of seeking aid from outside agencies, particularly child psychologists; and effect of, and opinions about, a child guidance clinic. It was hoped that discernable factors determining any or all of these opinions might be uncovered.

Procedures and Subjects

A brief account of the nature of the town of Sterling is in order. Sterling is a town of approximately 11,400 people situated on the north bank of the Rock River. It is about 100 miles due west of Chicago, and some 25 miles east of the Mississippi River and Iowa. It is on the main route of the Chicago and Northwestern line from Chicago to the Pacific Coast, and is also on the main line of the Greyhound bus, Chicago to the Pacific Coast route. A highly industrialized town, it has several factories, the largest of which is a wire mill. It also has considerable wealth for its size.

In two respects Sterling is somewhat atypical of the average midwestern town. It has a large unassimilated Mexican population living in a run-down section of town by the railroad tracks. Across the river is a twin city of 5,000 people. This city, Rock Falls, is mainly inhabited by factory workers. This probably means that the population of Sterling has a higher proportion of white collar workers, and a lower proportion of skilled and unskilled workers than would otherwise be expected.

There are at least six possible ways of attempting to find out what the people of a town think about bringing up children. They are enumerated below accompanied by pertinent criticisms:

1. Observation of people's actions in dealing with their children to note empirically what methods and techniques are common.

   Temporal and financial limitations, action bias due to observer's presence, and the fact that most discipline is carried out within the home contraindicated this method.

2. Asking people what they think is being done by others in rearing children.

This method is not indicated due to lack of training in observation of most people and preponderant intra-home solution of child-parent problems.

3. *Asking people about the methods their parents used with them.*

The factors of time lag and memory distortion rule out this method.

4. Asking children what methods have been used with them.

This method seems decidedly superior to the three preceding methods. Contraindications, however, include probable lack of insight into parental methods and possible conscious or unconscious repression, exaggeration or bias in regard to certain disciplinary or corrective actions.

5. Asking people what they do with their own children.

This method, however, personalizes the situation and many people shy away from relating their own actions, particularly if they have the slightest feeling that such actions may not be entirely approved by others.

6. Asking people what they would do if they were responsible for a child.

This is a desirable departure from the fifth method and allows the people with no children to give their opinions more naturally. It gives those who prefer to speak in general terms an opportunity to generalize their answers to some extent, and at the same time those who wish to speak about their own actions in bringing up their children may do so. This method was the one chosen.

The personal interview for gathering opinions was chosen with the expectation of a higher percentage of response than that predicted for a mailed questionnaire, even though a desirable anonymity was thereby sacrificed.

Since there was little precedence for a problem of this sort and it was difficult to make any accurate forecast of the type of answers which might be expected, open-ended questions were employed. It was felt that objective questions, such as multiple choice items, while more amenable to statistical treatment, might fail to elucidate many important types of response.

Specific information desired included: 1) To which agencies would people willingly turn for help in child rearing, and what is the relative popularity of each of these agencies? 2) What actions would people take when confronted by various sorts of problems connected with bringing up children? 3) Did the people feel the need of a specific agency or person who specializes in the problems of children and their parents?

Since a child guidance clinic had been held in Sterling, this seemed the appropriate situation in which to attempt to determine the effect of the program on the town and to note any reactions to the program.

Both for determining the general nature of the population of people interviewed, and to serve as a basis for locating possible causative reasons for varying opinions, certain personal questions relative to the respondents were deemed essential.

The *order of items* in the questionnaire was a key point. Personal information was placed last since it seemed probable that personal questions coming at the start of the interview might irritate the subject, or even result in his breaking off the interview, whereas by the end of the interview rapport should be better and the respondent more in the mood or habit of answering questions. This actually proved to be the case. There were no objections to any of the questions about occupation, education, number of children, etc.

It seemed that questions about the child guidance program, if asked early in the interview, might suggest the interviewer's connection with the clinic and possibly influence responses. Such questions, if asked too soon, might start the respondent thinking about such agencies as psychologists, or about things suggested during the clinic. For these reasons, it was decided that reference specifically to the clinic should come toward the end of the questionnaire, directly before the personal information closing the interview.

For similar reasons an inquiry as to the feeling of need for the services of a psychologist or psychological agency for child guidance was placed toward the end of the interview, directly in front of the queries about the clinic.

In an attempt to sample opinion on various types of child problems and methods of handling them, five fairly general problems were selected. They were: "trouble-making" children, children who lied, who stole, who failed in school, and children who were unusually shy. These questions were made as general as possible and the respondent's answers in no way suggested or restricted.

Information was desired about the agencies to which respondents might turn for advice about the above-mentioned problems. It seemed probable that the suggestion of consulting outside agencies might influence replies about how such problems should be handled. Thus, with some misgivings, the questions on the trouble-making, shy, stealing, lying and scholastically troubled children were placed first.

Since it was desired to determine whether the various agencies would be mentioned by the respondents without actually being suggested, the respondents were first asked which agencies they would consider. They were then specifically asked whether they would consider each of twelve different agencies.

The final form of the questionnaire, that is, the form actually used in conducting the interviews, follows:

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THE QUESTIONNAIRE

A.

1. If you were responsible for a child of from nine to twelve years old who was continually in trouble for fighting, talking back to you, and picking on other children, what, if anything, would you do about it?
2. If you were responsible for a child of from nine to twelve years old who was continually stealing things, what, if anything, would you do about it?
3. If you were responsible for a child of from nine to twelve years old who was always telling lies, even when he had no reason to tell them, what, if anything, would you do about it?
4. If you were responsible for a child from nine to twelve years old who was very shy and bashful and had few friends his own age, what, if anything, would you do about it?
5. If you were responsible for a child from nine to twelve years old who was continually failing in school what, if anything, would you do about it?

B. If you were responsible for a child who was in difficulty or trouble for any reason at all, and you didn't know what to do about it yourself, what people or agencies would you think of going to to ask for help?

C. Various people have suggested the following list of agencies and people as being posible places to turn for help if you were responsible for a child who was in difficulty or trouble for any reason at all. As I mention each agency will you tell me whether you would consider turning to it yourself under such circumstances?

1. Church.
2. A school teacher.
3. A school official.
4. A man who specializes in helping mentally sick people, such as a psychiatrist.
5. A state public health or welfare agency.
6. A doctor.
7. Some public official such as the mayor.
8. A man who has studied children and why they act as they do, such as a psychologist specializing in child guidance.
9. Some town or fraternal organization.
10. The police.
11. A close friend.
12. The Y.M.C.A.
13. Some agency not mentioned above.

D.

1. Do you believe there should be some recognized agency or person in Sterling whose sole job would be to advise or help people who were responsible for a child who was in difficulty or trouble, and didn't know what to do about it?
2. If there was such an agency which of the following four methods do you believe should be used to support it?
   a. It should be attached to the school system.
   b. It should be supported separately from town funds.

c. It should be supported by donations and gifts of interested people and organizations.
d. It should be supported by the payments of the people who use it.
e. It should be supported some other way.

E.

1. Did you hear or read anything about the child guidance program held here in Sterling this past February. If so: What?
2. Did you attend any of the talks in the program, and if so what did you think of them?

F.

1. Are you married?
2. Do you have any children? If yes: how many and what are their ages?
3. What is your occupation? (If housewife: What is your husband's occupation?)
4. How many years of school did you have?
5. Do you belong to any church, and if so what?
6. (Interviewer records sex.)
7. (Interviewer records estimated age.)
8. (Interviewer records color and obvious nationality.)

G. Respondent was asked for his name and address. It was explained that this was desired only for purposes of possible reliability checks, and if respondent preferred not to give his name no further attempt was made to get it.

The method of selecting the respondents had next to be decided upon. Use of a random sample (1, Ch. 8 : 2) selected from a complete list of adult townspeople was seriously considered to the point of utilizing it to make a small sample survey. It was at once apparent that with such a method the list of names and addresses from which the sample was chosen must be completely up to date and that time must be available to make repeated calls upon some homes until all the selected persons were found and interviewed. Since time was limited and a completely up-to-date town directory was not available this method was abandoned.

Stratified random sampling was considered. Here considerable extension of time would be needed to fill some of the categories of the strata toward the end of the survey. This method would also have entailed determining the actual proportion of various economic, financial, sex, educational, etc. divisions within the town, information which was not readily available.

It was thus determined that a form of area sampling (3) might be used.

Method of Selecting Respondents

To eliminate interviewer selection in the choice of respondents it was arbitrarily decided that every twenty-fifth house would be approached, but that if there was no one at this house, or if the person refused to be interviewed, the house next to it would be approached, and so on with each succeeding house until one of the houses in that particular vicinity had re-

sulted in an interview. For the purpose of counting the next 25 houses the first house approached was the point of departure. The town was divided in the middle from north to south. The method used was to go east away from the middle of town taking every twenty-fifth house until the end of town was reached. Then the interviewer walked up one block and returned to town along the next parallel street, again taking every twenty-fifth house, but starting his count on the new street from whatever number had been reached with the last house on the previous street. When all the east-west streets on the east side of town had thus been sampled the north-south streets on the east side of town were sampled in the same way.

On turning to the west side of town a small deviation in procedure was followed since it was noticed that the majority of houses faced on the east-west streets. Only the east-west streets were traversed, but in making the count of houses all houses on intersecting streets were counted as far as the next street north, and of course if any of these houses was the twenty-fifth one, it was approached. This greatly cut the amount of actual walking that was necessitated without in any way lessening the completeness of the coverage.

It should be realized that there is no way of knowing to what extent bias may have been introduced due to specifically differing characteristics of the "not-at-homes" and the refusals (3, 4).

Interviewing Procedure

For practical reasons it was necessary to complete the actual interviews over the course of two weekends, specifically those of April 9–10, and April 16–17. Because of time limitations, the author's wife, Pauline J. Murray, aided him in the interviewing. She had been closely observant of the actual development of the questionnaire to be used, and it was believed that her participation during one weekend would not materially bias results in any one direction.

To insure that all respondents would at least be answering questions which objectively were similar, the exact wording was decided upon and the entire questionnaire then memorized by both interviewers (4, 5). When it was suggested that the respondent did not understand the question it was repeated in exactly the same words. If the respondent still seemed not to understand, his answer was recorded as a "don't know" and the succeeding question asked.

Following procedure suggested by the National Opinion Research Council (6) the interviewer's approach was made as brief as possible. In effect, it became standardized as: "Good morning. I'm taking part in a survey and I'd like your opinion on a few matters such as [Followed by the first question]."

This usually resulted in an answer which could be followed up quickly by the second question. In no case did a respondent, having answered the first question, subsequently break off the interview.

Also following standard procedure (4, 6, 7, 8) the interviewer refrained from expressing any opinion of his own, and if asked this by the respondent either agreed with the respondent's expressed opinion, or, if that was not yet known, was noncommittal. Disapproval of the respondent's opinions was, of course, avoided as carefully as possible. Attempts to probe further for more complete answers were made in a manner as completely non-suggestive as possible, such as by repeating the respondent's words with appropriate inflection, asking for examples, or asking him how he happened to notice such a thing (9). The interviewer attempted always to act in a friendly and interested manner towards everything the respondent had to say. The clothing worn by the interviewers was chosen for its neatness and to blend inconspicuously with the type of clothes apparent in Sterling (7).

In general, the respondents raised few questions as to the purpose of the interviews or the organization represented by the interviewer. In cases where such question was raised, the standard answer was: "Lots of people have had trouble with this sort of problem and it was decided that it would be valuable to know just what other people think should or could be done in such cases." Further questions as to who was conducting the survey were met with "An organization in Chicago." In three cases the respondents were not satisfied with this answer, and they were then told that the organization was Northwestern University.

The purpose of leaving the University out of the picture when possible was because it was felt that the respondents might feel more desire to give prestige or knowledge-indicating answers rather than answers indicative of their own most likely actions. It was also felt that the mention of the University might lead some respondents to connect the survey with the child guidance clinic, a possibility which as previously indicated was considered undesirable.

Whenever possible, respondents' answers were recorded verbatim. When this was difficult as much as possible was recorded, and every effort was made to keep the respondent's meaning completely unchanged.

Despite the fact that the interviews took place in large part during evenings and weekends it was found that more women than men were encountered. Therefore, an attempt was made to speak to the man of the house, to maintain as nearly equal representation of both sexes as possible (6).

Ninety interviews were conducted. The number ninety was rather arbitrarily chosen as being a reasonably good approximation of one percent of the adult population of Sterling, and at the same time being a large enough number to lend relative stability to the various types of answers and results. Of the ninety interviews the author conducted seventy and his wife twenty.

Evaluation of Questionnaire Items

Of all questionnaire items, the first five were the most difficult to evaluate. For these items, which dealt with major problems (stealing, shyness,

etc.), it was decided to set up categories of answers. Insofar as possible these categories were kept constant over the five major problems to facilitate comparisons. However, in many cases this was difficult since some of the major problems seemed to call out solutions quite different from those suggested by other major problems. Answers requiring more than one category for dealing with a problem were recorded as coming under any of the categories used, but the dominant answer, in such instances, was indicated.

In enumerating the respondent's reactions to the suggestion that various agencies might be suitable places to which to turn for help and advice on rearing or handling a problem child, five rather than three categories were used for the reason that, in addition to the "don't knows," and the straight "yes" and "no" answers, there were many doubtful or qualified "yes" and "no" replies. The answers which indicated a desire for an agent or person in Sterling whose sole job would be to help with problems of parents and children fell more definitely into the "yes" and "no" categories, which were used together with a "don't know" group.

Since financial support of a person or agency in Sterling seemed relatively limited, the question regarding this possibility was put in the form of multiple choices. Here it was necessary to count simply the number of times each choice had been utilized to give the data appropriate quantification.

Answers to the question on reaction to the child guidance program were divided into five groups: persons who had never heard of it; those who had read about it, but didn't remember enough to have any opinion; those who had heard about it, but didn't remember enough to have any opinion; those who had heard or read about it and did remember enough to be able to give a definite opinion on its effect; and those who had actually been to some of the meetings.

Quantification of factual data about the respondent was routine and presented no difficulties.

All categories of all answers were computed as a percent of the total population of respondents. This was done regardless of whether the total number of answers added up to ninety or more than ninety. It was felt that these percentage answers would provide a clear idea of the character, and of the type of opinions held by the respondents, and would simplify the task of making generalizations from the sample interviewed to the population of Sterling as a whole.

Interrelationships between answers to certain questions and certain factual characteristics for the sample interviewed were evaluated in terms of chi square. In doing this an attempt was made to choose categories which seemed most likely to be related with, or in some way causal of, the category with which they were being paired, in the hope that in this way some of the dynamics back of the various sorts of answers might be uncovered. Chi squares were also computed between certain of the answers to the five major problems in an attempt to learn whether or not people tended to use

certain types of solutions for several of the problems, or whether their answers from problem to problem were independent.

Results

Given limited monetary resources and time, a questionnaire such as was used, coupled with a variation of area sampling, appears to be an acceptable method of ascertaining the state of a town's opinion relative to certain problems. Whether it is the optimal method of doing these things may, of

TABLE I

Breakdown of Survey Sample

Factor	*Number*	*Percent*	*Factor*	*Number*	*Percent*
Marital Status			Age of Children		
Married	88	97.8	All over twenty-one	24	26.7
Single	2	2.2	All under twenty-one	44	48.9
Sex			Both	5	5.6
Male	39	43.3	Occupational Group		
Female	51	56.7	Professional and semi-professional	10	11.1
Education			Sales and clerical	15	16.7
0–8th grade	30	33.3	Farmer	3	3.3
9th–12th grade	51	56.7	Service occupations	3	3.3
13th grade up	9	10.0	Skilled and semi-skilled	43	47.8
Religion			Unskilled	13	14.4
Protestant	57	63.3	Armed forces	3	3.3
Catholic	27	30.0	Estimated Age (Years)		
None	6	6.7	20–30	13	14.4
Race			30–40	27	30.0
White American	85	94.4	40–50	17	18.8
Mexican	5	5.6	50–60	9	10.0
Number of Children			60–70	12	13.3
None	17	18.9	70–80	7	7.8
One	12	13.3	80–90	5	5.6
Two	30	33.3			
Three	17	18.8			
Four	9	10.0			
Five to Eight	5	5.6			

course, be fully determined only by the course of future research in fields such as social and child psychology; at our present state of knowledge and technical competence it seems close to the optimal method.

The character of the sample obtained may be seen by a glance at Table I. The most obvious way in which there seems to be a deviation from a representative sample is that only two unmarried people were interviewed.

It is posited that this is a function of the method used, since homes only were visited, leaving out entirely hotels or hotel-type dwellings in the business district. Many of the unmarried population would doubtless live in such accommodations. There is greater likelihood, also, of the single adult being away from home and engaged in various social activities. There is no way of knowing whether this omission of a representative group of unmarried adults has seriously biased results. To some extent we may assume that the relatively low proportion of people estimated as being in the twenty to thirty age range, as shown in Table I may be due to this lack of young single respondents. Insofar as can be determined, estimated age does not appear to be related to type of response, as we shall see.

Despite the fact that much of the interviewing was conducted at night and over weekends, a preponderance of female respondents will be noted. However, the preponderance is not excessive and probably not serious.

To procure the ninety interviews, a total of 118 homes were called on. At 9.3% of these houses the prospective respondent refused to be interviewed. This is roughly in line with the percentage of refusals encountered by other investigators (3).

At 14.4% of the houses there was no reply. There is some indication that the "not-at-homes" do tend to differ significantly in their opinions from those at home for some types of questions (1, 4). Assuming applicability of these findings to the sort of questions asked here, it is still doubtful whether in an admittedly preliminary investigation such as this such a difference would make a sufficient change to alter the overall results and generalizations arrived at.

Results of the first five questions are enumerated in Table II.

It will be noted that *punishment* and *attempts at verbal persuasion* are the most frequently suggested methods of dealing with the "trouble-making" child. These same techniques are also popular for dealing with both the child who *steals things* and the child who *tells lies*. Turning to the *shy and bashful child* a greater spread of the responses was found with none of them having a majority of the choices.

With the *child who is failing in school,* an attempt to improve the quality or quantity of the child's homework, usually by helping him with it, and less frequently by making him do more work at home or setting definite hours for home study, and turning to an outside agency for help and advice, were the most popular responses found.

Because of the large number of punishment responses to the questions about trouble-making, stealing, and lying children a breakdown of these responses was made (Table III). It will be noted that the most popular sort of punisment appears to be physical, usually indicated by such statements as: "give him a whipping," "lick him, spare the rod and spoil the child," or simply, "I'd spank him."

For the child who was failing in school, a large number of people indicated they would consult outside agencies. This response was, therefore,

TABLE II

RESPONSES TO FIRST FIVE QUESTIONS

Responses	Question One[1] *Trouble-Making* Number	Percent	Question Two[1] *Stealing* Number	Percent	Question Three[1] *Telling Lies* Number	Percent	Question Four[1] *Shy* Number	Percent	Question Five[1] *Failing in School* Number	Percent
Attempt to correct the situation by talking to or with the child	29	32.2	35	38.9	42	46.7	16[3]	17.8	20[4]	22.2
Punish the child in some way[2]	35	38.9	20	22.2	22	24.4	0	0.0	3	3.3
Depend on individual child and particular circumstances	10	11.1	8	8.9	6	6.7	3	3.3	5	5.6
Attempt to supervise and regulate child's life to greater degree	4	4.4	4	4.4	0	0.0	0	0.0	0	0.0
Increase the religious influence in child's life	4	4.4	6	6.7	4	4.4	0	0.0	0	0.0
Go to outside agency for help and/or advice	3	3.3	3	3.3	4	4.4	4	4.4	44[5]	48.9
Make child return what he stole and apologize	0	0.0	12	13.3	0	0.0	0	0.0	0	0.0
Be sure child's normal wants sufficiently met for him not to feel he must steal to get what he wants	0	0.0	6	6.7	0	0.0	0	0.0	0	0.0
Threaten or scare child	0	0.0	5[6]	5.6	0	0.0	17	18.9	0	0.0
Attempt to divert or fill needs of child in more acceptable way	0	0.0	4	4.4	0	0.0	0	0.0	0	0.0
Appeal to his pride or better nature by showing trust in him	0	0.0	3	3.3	0	0.0	0	0.0	0	0.0
Set a good example for child	0	0.0	0	0.0	3	3.3	0	0.0	0	0.0

TABLE II (*continued*)

Responses	Question One[1] *Trouble-Making* Number	Percent	Question Two[1] *Stealing* Number	Percent	Question Three[1] *Telling Lies* Number	Percent	Question Four[1] *Shy* Number	Percent	Question Five[1] *Failing in School* Number	Percent
Make light of problem. Think child will outgrow it without action being taken	0	0.0	0	0.0	3	3.3	6	6.7	0	0.0
Attempt to build child's confidence in some way	0	0.0	0	0.0	0	0.0	25	27.5	0	0.0
Attempt to procure friends for child	0	0.0	0	0.0	0	0.0	18	20.0	0	0.0
Would not force or threaten child	0	0.0	0	0.0	0	0.0	8	8.9	0	0.0
Accompany child places to help him get along with others and make friends	0	0.0	0	0.0	0	0.0	7	7.8	0	0.0
Do something to improve homework	0	0.0	0	0.0	0	0.0	0	0.0	49	54.4
Give child more attention and/or show more interest in his work	0	0.0	0	0.0	0	0.0	0	0.0	4	4.4
Miscellaneous (Used by two or less)	6	6.7	3	3.3	8	8.9	7	7.8	11	12.2
Answers which dodge the question	8	8.9	2	2.2	5	5.5	4	4.4	3	3.3
"Don't know" responses	5	5.6	12	13.3	10	11.1	9	10.0	2	2.2
TOTALS	104	115.5[7]	123	136.5[7]	107	118.7[7]	124	137.8[7]	141	156.5[7]

[1] See page 83 for wording of questions.

[2] See Table III for further breakdown of these responses.

[3] Specifically by trying to persuade child to make more friends.

[4] Combination of responses indicating respondent would talk to or with child, and would encourage, praise, or coax child.

[5] See Table IV for further breakdown of this response.

[6] Specifically by threat of police.

[7] Greater than 100 per cent since many people's answers were placed in two categories, and a few answers fit into three or four categories.

broken down by agencies (Table IV). In the majority of these cases, the *teacher* was the popular suggestion. That the *doctor* is suggested in 25% of the cases suggests, perhaps, a possible association in the minds of the respondents between poor school work and underlying ill health or malfunction of a physical nature.

TABLE III

BREAKDOWN BY TYPES OF PUNISHMENT OF RESPONSES OF THOSE WHO WOULD PUNISH A CHILD WHO MADE TROUBLE, STOLE THINGS, OR TOLD LIES

Problem	*Method of Punishment*				
	Physically	Deprivation	Miscellaneous	Unspecified	Totals
Child who fights and talks back.					
Number	21	6	5	3	35
Percent of total responses	23.3	6.7	5.6	3.3	38.9
Percent of those who would punish	60.0	17.1	14.3	8.6	100.0
Child who steals things.					
Number	8	8	1	3	20
Percent of total responses	8.9	8.9	1.1	3.3	22.2
Percent of those who would punish	40.0	40.0	5.0	15.0	100.0
Child who tells lies.					
Number	9	6	2	5	22
Percent of total responses	10.0	6.7	2.2	5.6	24.5
Percent of those who would punish	40.9	27.3	9.1	22.7	100.0

Of the responses to questions one to five, those dealing with "problems," several were utilized for more than one of the questions. Table II may be used to compare the numerical strength of some of these responses for the five questions. It may be noted that *verbal attempts to change the child's behavior* are most frequently suggested for the child who tells lies, and least frequently suggested for the shy and bashful child. *Punishment* is suggested most frequently for the trouble-making child, rarely for the child failing in school, and never for the shy child. This may indicate a feeling that shyness and failing may be something a child cannot consciously help.

The respondents were most likely to *consider the individual* if the problem was "trouble-making," least likely if it was shyness. A possible expla-

nation is that respondents are less likely to think they know the causes of shyness.

However, regardless of knowledge, the respondents seem to have considerably more faith in the efficacy of *interest in* and *attention to the child* who is shy than they do with the other types of problem children mentioned (although the other "problems" symptomatically would seem more obviously to be attention-getting mechanisms, indicating need for attention).

TABLE IV

BREAKDOWN ACCORDING TO AGENCIES OF THE RESPONSES OF THOSE WHO WOULD TURN TO OUTSIDE AGENCIES FOR HELP WITH OR ADVICE ABOUT A CHILD WHO WAS CONTINUALLY FAILING IN SCHOOL

Agency	Number of People giving this Response	Percent of Total Responses	Percent of those who would seek help of Outside Agencies
Teacher	28	31.1	63.6
Principal or Superintendent	4	4.4	9.1
Private Tutor	1	1.1	2.3
Doctor	11	12.2	25.0
TOTALS	44	48.8	100.0

It is again with the shy child that the greatest number of "do nothing" responses were found. This may indicate a general belief that shyness seems, to adults, to be less of a problem than such things as stealing, lying, fighting and failing in school.

On the assumption that it would be worthwhile to determine whether a person who suggested a certain course of action for dealing with the child who stole things would tend to suggest the same solution for the trouble-maker or the child who told lies, the technique of chi square was utilized to provide an answer. Only lying, stealing and trouble-making were considered since similar solutions were frequently applied to all of these. The two suggested courses of action considered were punishment and verbal attempts at correction, since these were the two responses most frequently encountered over all three questions.

Chi squares were computed for use of punishment or non-punishment methods of dealing with the several pairs of problems and also for the use or non-use of verbal attempts at correction for the same pairs of problems. All but one of these chi squares were significant at the 1% level. It would appear from these results that to some extent the respondents tended to

think of stealing, lying, and fighting as being very similar types of problems to the extent that similar corrective devices might well be applied to solving them.

TABLE V

RESPONSES GIVEN TO QUESTION, "IF YOU HAD A CHILD OF FROM 9 TO 12 YEARS OLD WHO WAS IN TROUBLE FOR ANY REASON AT ALL WHAT PEOPLE OR AGENCIES WOULD YOU THINK OF GOING TO TO ASK FOR HELP"; AND TO THE QUESTION OF WHETHER THEY WOULD CONSIDER GOING TO EACH OF TWELVE SPECIFIC AGENCIES

Percents

Agencies	Agencies, (not specified), would go to	*Would you consider going to (name of one of agencies below) for help?* Yes	Qualified Yes	Don't Know, or Not Sure	Qualified No	No
Church	38.9	84.4	7.8	0.0	0.0	7.8
Teacher	18.9	73.3	18.8	0.0	2.2	5.6
School official	13.3	48.9	24.4	1.1	6.7	18.8
Psychiatrist[1]	3.3	30.0	26.7	7.8	10.0	25.6
State Public Health or Welfare Agency	0.0	31.1	18.8	12.2	11.1	26.7
Doctor	11.1	71.1	21.1	2.2	1.1	4.4
Public official	0.0	8.9	15.6	4.4	11.1	60.0
Psychologist[2]	2.2	45.6	16.7	6.7	5.8	25.6
Town club or fraternal organization	0.0	15.6	12.2	11.1	5.6	55.6
Police	3.3	12.2	13.3	2.2	24.4	47.8
Close friend	0.0	58.9	18.9	1.1	3.3	17.8
Y.M.C.A.	7.8	57.8	10.0	6.7	6.7	18.8
Other agency not mentioned:						
Boy Scouts	4.4	10.0[3]				
Miscellaneous	16.6	10.0[3]				
No one, deal with it oneself	11.1					

[1] Worded as: "A man who specializes in helping mentally sick people, such as a psychiatrist."

[2] Worded as: "A man who has studied children and why they act as they do, such as a psychologist specializing in child guidance."

[3] Since these agencies were not specifically suggested by the questionnaire in question C we cannot know, if they were not suggested by the respondent, whether he would have been favorable or unfavorable towards them had they been suggested to him.

Table V affords an interesting comparison between the number of people who, when asked what agencies they would consider consulting about their problems, would think spontaneously of a particular agency and the number of people who say they would favorably consider that same agency when the agency is actually suggested to them. School teachers, for example, would apparently be approved of by four times as many people when they were mentioned by the interviewer, as when merely asked for the names of agencies they would turn to. Nobody mentioned the state public health or welfare agency when asked for names of agencies they might consider, yet when asked specifically if they would consider going to such an agency, 31.1% of the respondents indicated definitely that they would, and 18.8% gave a qualified "yes."

This indicates, probably, that many agencies, while favorably regarded, are not utilized often by people who need them, merely because people don't happen to think of them at the proper time. Possibly a campaign simply and primarily to make the public more continuously aware of their functions and facilities might result in their increased utilization.

Table V also gives an interesting estimate of the relative popularity of various agencies which have partially or wholly entered into child guidance activities at various times. The prestige of the church may be noted in that more people would turn to it than to any other organization. Physicians, too, appear to have tremendous prestige in the child guidance area, being more favorably considered by the respondents than all other agencies save the church and school teachers.

Psychologists were favorably considered by a decidedly larger number of people than considered them unfavorably, but they were considered less favorably in general than school officials, close friends, and the Y.M.C.A., not to mention physicians, teachers, and the church.

Some mention should be made of the omission of the Boy Scouts from the list of 12 specifically suggested agencies. The fact that, on completion of the 12 names and subsequent query as to whether the respondent could think of additional agencies, 10% of the respondents mentioned the Boy Scouts indicates that this organization would probably have ranked with the five or six most popular agencies had they been specifically suggested. The omission of Boy Scouts from the list was a decided oversight; it was, however, the only organization with any great popularity in the child guidance field which was thus omitted.

Table VI shows the answers to the questions on whether the respondent felt the need for a full-time child guidance specialist or agency, and also the numbers who preferred the various possible ways of supporting such an agency or person. That 70% say they feel that there is a need for it certainly indicates a receptive attitude.

No one method of supporting such an agency or person was overwhelmingly preferred. Support from town funds was the modal choice

however; dependence on gifts and donations was the least frequently indicated.

That there tends to be a relationship between responses having to do with need for such an agency and the suggested method of supporting it is indicated by a chi square between the two which is significant at the 1% level.

TABLE VI

RESPONSES TO QUESTIONS D1[1] AND D3[2]

Which method do you believe should be used to support the agency?	*Percents* *Should there be a specific child guidance agency in Sterling?*				
	Yes	No	Undecided	Don't know	Totals
Attached to the school system	18.9	2.2	0.0	0.0	21.1
Supported separately by town funds	25.6	5.6	2.2	0.0	33.3
Supported by gifts and donations of interested people and organizations	8.9	1.1	0.0	0.0	10.0
Supported by the payments of the people who use it	11.1	11.1	1.1	0.0	23.3
Supported in some other way, or "Don't know"	5.6	1.1	1.1	4.4	12.2
TOTALS	70.0	21.1	4.4	4.4	99.9

1 "Do you believe there should be some recognized agency or person in Sterling whose sole job would be to advise or help people who were responsible for a child who was in difficulty or trouble, and didn't know what to do about it?"

2 "If there was such an agency which of five specified methods do you believe should be used to support it?"

A rather important deduction may be made from a comparison of the number of people who say "yes" they would consider consulting "a man who has studied children and why they act as they do, such as a psychologist specializing in child guidance" (45.6%, Table V), and the number of people who say that they are in favor of Sterling having a recognized person or agency whose sole job would be to advise or help people with their child rearing problems (70%, Table VI).

Actually both of these questions suggest the use of a child psychologist. There appear to be two major differences in the two questions. One is that the first presents the problem more personally than the second. The other is that in the second question the word "psychologist" is actually used.

Because of the differing personal factor in the two questions, caution must be exercised. It seems probable that we may have here a concrete example of public approval of the function of the child psychologist accompanied by a certain ignorance or misconception of the fact that it *is* the function of the child psychologist. Accompanying this may be a confusion between the word "psychologist" and the word "psychiatrist."

TABLE VII

RESPONSES TO QUESTION E: "DID YOU HEAR OR READ ANYTHING ABOUT THE CHILD GUIDANCE PROGRAM HELD HERE IN STERLING THIS PAST FEBRUARY? IF SO, WHAT?"

Response	Number giving this response	Percent giving this response
No, hadn't read or heard of it	64	71.1
Heard about it but don't remember what	7	7.8
Read about it but don't remeber what	11	12.2
Heard about it and gave opinions on the program	3	3.3
Attended one or more of the talks	5	5.6

Perhaps such data as these may point to the need of a public relations campaign directed at elucidating, in simple and easily understood terms, the function of the child psychologist.

It is apparent from a glance at Table VII that few people remembered reading or hearing about the child guidance clinic held in Sterling and few of those who did read or hear about it remembered anything about it. Hence, no statistical evaluation of the effects of the program on Sterling may be made. That this was not due to lack of publicity may be determined from an evaluation of the following:

PUBLICITY PRECEDING AND ATTENDING THE STERLING CHILD GUIDANCE CLINIC

There were four news stories on the clinic in the Sterling paper, an afternoon daily of wide circulation.

The first story was on Tuesday, February 8, 1949, one week before the start of the clinic. This story told of the clinic and of the plans that were being made in conjunction with it. It had a two-column head on the top of the front page, and its total length was approximately three-fourths of a column.

The second story was on Monday, February 14, 1949, the day before the opening of the clinic. In this story further details of the program and plans being

made for it were related. This story too was about three-fourths of a column long, and started in the upper half of the middle of the front page. In the story all who were interested in the program were invited to attend.

The third story was on Wednesday, February 16, 1949, and told in some detail of the addresses Dr. Richards made to the joint Parent-Teachers Association meeting. This story had a two-column head on the upper half of the front page on columns one and two, ran for about half a column there and was then continued to page 11 where it filled the upper fourth of the page along the top.

The fourth story was on Friday, February 18, 1949, and told of what went on during the program after the joint Parent-Teachers Association meeting. This story, like the others, was on the upper half of the front page, and it carried a two-column head. It was placed beside a picture of Dr. Richards heading a parent-youth panel.

In addition to the newspaper stories the clinic was announced through all the Parent-Teachers Associations and the children were told to tell all their parents about it and invite them to come.

This discussion of publicity and its effect seems to indicate that some more novel or attention catching device is needed to present child guidance principles and theory effectively to the populace of a town in a way which will insure that they remain in the memory of people for any period of time. What method should be used is not within the province of this paper to suggest. Suffice it to say that the traditional lecture and case study method, such as was used in Sterling, apparently had little power to alter the beliefs and opinions of the people; or even to remain for long in their memories.

In an effort to locate some of the dynamics behind answers to several of the questions, chi squares were computed between certain of these answers and certain characteristics of the survey population such as occupational class, education, sex, etc. Chi squares were computed only for those relationships which appeared to be most pregnant with possible significant material, or which promised to throw special light on feeling toward the child psychologist.

All of these chi squares were well below the level of significance. We may conclude that the dynamics of responses to these questions probably lie in deeper, less easily determined factors than those laid bare by this questionnaire.

An attempt was made to determine whether sex exercised any causal effect on the type of correction suggested for the problems of lying and fighting. The modal response for each of these problems was used in computing chi squares with sex. In each case chi square was not significant.

It seems probable that sex tends not to be causal in the opinions expressed about these problems.

Summary and Conclusions

An instrument has been devised for sampling opinion of questions of child raising and on the effects of a four-day child guidance clinic in the

town in which the survey was conducted. Within the necessary time and monetary limitations this instrument appears adequate for its purpose.

This instrument, a personal interview type questionnaire, was administered to approximately 1% of the adult population of a relatively representative medium-sized midwestern town. Respondents were chosen by a modified form of area sampling.

The following conclusions are made on the basis of respondents' answers to the questions:

1. The two most popular methods of dealing with children who fight, lie, and steal are through punishment and some verbal attempt at persuasion.

2. The most frequently suggested methods of helping shy and bashful children are to build their confidence, find them more friends, force them to make more friends, and to attempt verbally to persuade them to make more friends.

3. Concentrating on the quantity of the child's homework or turning to the teacher or physician are the most popular methods of helping a child who is failing in school.

4. The church is the most popular outside agency considered for help in child guidance. Teachers and physicians also enjoy great popularity.

5. More people would consider turning to a psychologist for help with their children than would not consider doing so.

6. Seventy percent of the people in the town felt the need of a permanent child guidance specialist or agency. The most popular method of supporting such an agency was with town funds. Many people also thought it should be attached to the school system or paid for by the people who used it.

7. Despite widespread publicity most of the respondents could remember little or nothing of a four-day child guidance clinic held in the town two months before. It is suggested that the combined case study and lecture method used was not sufficiently novel and dramatic to catch and retain public attention and interest.

8. There appears to be little underlying relation between the factors of age, sex, religion, occupation, education or number of children, and the responses to the various questions.

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PREFERENCE OF ADOLESCENTS FOR RORSCHACH FIGURES[1]

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INTRODUCTION

The purpose of this study is to explore the possibility that the relatively simple task of ranking the blots in order of preference might serve as a rapid method for getting at the crucial features of the total Rorschach performance.

Literature Bearing on the Problem

Most orthodox Rorschach investigators seem to believe with Rabin and Sanderson (5) "that the obtainable picture is a function of the configuration or pattern Gestalt; the lifting of any single factor from its context, therefore, may violate Rorschach's basic principle." In the present investigation an attempt was made to preserve theoretically this Gestalt approach.

Rorschach (6) asks the question "Is the figure conceived and interpreted as a whole or in parts?" Rorschach records provide some information on this topic. Subjects respond to the blot as a whole, to details, and also to rare details. An individual's approach type is thought to show how he uses his functioning intelligence. However, this does not show whether a single response based on a Gestalt impression of each of the ten Rorschach cards could be used for diagnostic clinical purposes.

An investigation by Wallen (7) sheds some light on the possibility of using rankings of the Rorschach cards to differentiate clinical groups. The purpose of his study was to determine the pleasingness of each card when conditions of sequence, position, and color were altered. Reactions of stable and unstable men were compared; the unstable men were about to be discharged for psychiatric unsuitability to military service. Wallen obtained the following results:

1. Card VI differentiates stable and unstable groups better than any other card.
2. Card IX also differentiates between stable and unstable groups in both chromatic and achromatic forms.
3. Cards II, VI, and IX arouse more dislike reactions in unstable men than in normal men, but the importance of color in producing this dislike is confirmed only for card II.
4. Simultaneous comparison of chromatic with achromatic versions of the standard color cards reveals that unstable men prefer the achromatic version (i.e., are color-shy) of three of the cards.

[1] This material is taken from a master's thesis carried on at Northwestern University. Acknowledgment is due Dr. T. W. Richards for his help and advice, and to Mr. M. S. Johnson, Dean of Boys, Miss T. Freeman, Clinical Counselor, and the Personnel Department of Maine Township High School for their cooperation.

5. Stable and unstable groups of men differ in their expressed liking for certain Rorschach cards. These cards, *II, VI,* and *IX,* are those which clinicians note as the usual source of shock during Rorschach examinations.

Wallen concludes from his data that unstable individuals show affective reactions to the cards which differentiate them from stable persons.

In Wallen's study the men were not asked to rank the cards in order of preference; the subjects were asked to tell whether they liked or disliked each card, and the percentage of groups liking each card was determined. The subjects used in the present study were asked to rank the cards from the one liked most to the one liked least after the Rorschach protocol had been obtained.

The subjects used in this investigation were "normal" high school pupils rather than clinical groups.

Procedure

Subjects for this experiment were secured during the spring of 1949 at Maine Township High School, which is situated between Park Ridge and Des Plaines, Illinois. All the subjects were juniors in high school; fifteen girls and fifteen boys were used. In order to secure a random sample of the junior class, alphabetical lists of the boys and girls were numbered and then subjects were selected from a table of random numbers.

All the subjects were spoken to beforehand and asked to take a test; they were not told what kind of a test. They were informed that the test was not to provide information about themselves personally, but merely to provide subjects for a research project. The thirty juniors were tested in a room adjacent to the Personnel Office.

Each subject was given the Rorschach test, both free association period and inquiry. After the entire Rorschach protocol was secured, the subject was asked "to put the Rorschach cards in your order of preference, from the one liked most to the one liked least. Spread the ink blots out on the table any way you desire so that you can see the cards better."

The subjects were then asked to put the five black-white cards in that same order, then the five colored cards. This was done to see if they had changed their minds about the order of preference. It was felt that this would increase the reliability of the rankings. After the rankings had been secured, the subjects were asked why they had liked the two cards which they preferred most and also why they disliked the two which they preferred least.

Characteristics of the Group

The mean age of the girls tested was 16.83 years, with a sigma of 6.49 months. The boys' mean age was 16.97 years, sigma 5.23 months. The difference in age was not significant statistically.

Henman Nelson I.Q.'s were available on the entire sample population. The mean I.Q. for the fifteen girls was 110.40, sigma, 14.74. For boys the mean I.Q. was 112.67, sigma, 12.70. There was no statistically significant difference between the boys and girls in I.Q.

Table I summarizes the results obtained on the thirty adolescent subjects on specific Rorschach test factors. The following points show how high school juniors compare with Beck's (2) normal adult control group.

TABLE I

RORSCHACH TEST RESULTS

Rorschach Test Factor	*Mean*		*Sigma*		*Range*	
	Girls	Boys	Girls	Boys	Girls	Boys
F+ percentage	74.60	78.93	10.23	8.58	53 – 90	68 – 100
A percentage	51.86	47.06	13.32	13.89	25 – 77	26 – 75
P	5.86	5.33	1.91	1.96	2 – 9	2 – 9
s	2.30	3.53	1.58	3.61	0 – 6	0 – 13
T/R (seconds)	33.26	47.26	9.98	11.57	18 – 60	24 – 180
T/first R (seconds)	14.80	21.66	7.15	13.55	9 – 34	7 – 64
Z	26.57	27.70	20.82	20.27	5.0 – 60.5	0 – 78.5
No. of R	29.06	31.66	10.92	17.73	13 – 53	9 – 80
No. of content categories	9.53	10.20	3.49	4.21	4 – 15	4 – 20
M	2.66	1.80	2.16	1.76	0 – 9	0 – 6
C	4.56	4.70	2.55	4.25	0.5 – 9.5	0.5 – 17

1. The mean F+ percentage for Beck's control group was 83.91, the standard deviation 8.12. The mean F+ for these subjects was lower, suggesting that the adolescents do not have as much conscious control and respect for reality as normal adults. F+ supposedly varies with affectivity, so that it is reasonable that some emotional distortion might be expected from adolescents. Sixty per cent is considered by Beck the critical minimum for the healthy; two of our girls did not meet this criterion, having F+ percentages of 53 and 56.
2. Beck's control group had a mean of 46.87 with a standard deviation of 17.58 for per cent animal responses, or A per cent. According to Beck's view of the Rorschach, this group shows, therefore, a slightly greater amount of adaptive thinking, more conformity or stereotyping.
3. Beck found normal adults to have a mean of seven popular responses with the "healthiest" individuals going to eight or nine. The fact is "that most intelligent persons, those entirely liberated in their percep-

tions and least stereotyped, can still be, and most often are, socially quite adaptive in their outward behavior." According to this criterion, these adolescents show less conventionality and ability to participate in the common thinking of their culture than do normal adults.

4. Beck (3) found that 0 to 1 white space percepts was average while four white space percepts were high. Rorschach states that this type

TABLE II

GIRLS' RANKINGS

Subject:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Card I	8	9	6	8	10	9	9	8	3	6	4	8	3	8	9
Card II	9	5	10	4	9	5	4	7	8	9	10	4	9	7	5
Card III	5	4	4	1	4	3	3	4	5	8	5	5	6	10	4
Card IV	7	8	3	9	6	8	8	10	4	4	6	9	7	5	8
Card V	4	10	9	2	7	7	7	9	2	1	9	10	4	6	10
Card VI	10	2	7	10	8	10	10	6	6	5	7	7	5	4	7
Card VII	6	1	1	5	5	6	1	5	1	10	8	6	8	9	3
Card VIII	3	6	8	3	3	2	6	2	7	2	3	3	10	3	6
Card IX	2	3	2	7	2	4	2	3	10	3	1	2	1	2	2
Card X	1	7	5	6	1	1	5	1	9	7	2	1	2	1	1

of response "always indicates some tendency towards opposition." The number of white space responses found in this group (2.30 for girls and 3.53 for boys) suggests the presence of an attitude of rebellion, contrariness, or hostility, if we subscribe to Rorschach's theory.

5. The central tendency of the time per-first-response for all the cards is around 20 seconds, according to Beck. The adolescent girls' mean for T/first R was 5 seconds lower than this.
6. For Z the mean of Beck's group was 31.10, the standard deviation being 26.44. Thus, the subjects in this experiment (with a mean of 26.57 and 27.70) were slightly lower in their capacity to grasp relations not perceived by others.
7. Thirty-one responses is average, according to Beck. In this respect these adolescents barely differed from Beck's norms.
8. Beck states that as far as the number of content categories used is concerned, breadth varies directly as functioning intelligence. Most of these subjects were fairly close to the results of "normal" adults in this respect, only a few showing constriction, or reduced range of content.

9. The means for color (emotionality) and human movement (inner living) show that these subjects give more C than M. Thus there is suggestion that they were more extraverted than introverted. These adolescents seem to be in emotional contact with their environment and minimally to be adjusting by retreating to fantasy living. Only two girls and three boys showed an experience balance (ratio of color to movement) in which M was greater than C.

TABLE III

BOYS' RANKINGS

Subject:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Card I	2	5	6	7	6	3	6	9	10	10	8	5	9	8	5
Card II	1	9	4	8	2	7	9	6	6	5	3	4	5	9	9
Card III	6	2	5	2	9	1	4	4	7	4	1	6	6	10	8
Card IV	4	8	8	5	10	9	8	5	4	9	4	9	7	5	7
Card V	8	6	9	9	7	8	7	10	8	6	9	7	10	6	6
Card VI	5	7	7	10	8	10	5	8	5	7	10	10	8	4	3
Card VII	7	1	10	3	4	6	10	7	9	8	2	3	2	7	10
Card VIII	10	3	3	1	3	2	1	3	3	3	7	2	4	1	2
Card IX	9	4	2	6	5	5	2	2	1	2	6	1	3	2	1
Card X	3	10	1	4	1	4	3	1	2	1	5	8	1	3	4

RESULTS OF RANKING

Tables II and III present the ranks given each card by each subject. Table IV presents mean rank for each card by sex, with sigmas for each group. Figure 1 shows these relative rankings in order, from first to tenth. Inspection of Figure 1 shows that, considering both sexes together, cards IX and X, and close behind them, card VIII, are most preferred. These are, of course, the multicolored figures. In a cluster as least preferred by both sexes are cards V, VI, I and IV, all achromatic.

In these selections, the achromatic card VII seems to be chosen close to the four preferred colored cards, and to precede the chromatic II which seems to be chosen later with the four unpopular achromatic cards.

In general, then, colored figures (with the exception of II) are preferred, while achromatic figures (with the exception of VII) are rejected until later.

Sex Differences

Tests of the significance of differences between sexes in their preference for the cards were made for both means and sigmas. The greatest sex

difference for absolute rankings is found on card II in the direction of acceptance by the boys. However, this difference is of slight statistical significance, since it could occur 20 per cent of the time by chance alone. It might be expected that adolescent girls would respond unfavorably to this card. The red spots on Card II are thought to suggest blood to them,

TABLE IV

MEAN RANKINGS OF GIRLS AND BOYS

	Girls ($N=15$)		*Boys* ($N=15$)	
	Mean	Sigma	Mean	Sigma
Card I	7.20	2.20	6.60	2.33
Card II	7.00	2.22	5.80	2.59
Card III	4.73	2.06	5.00	2.70
Card IV	6.80	2.01	6.80	2.04
Card V	6.47	3.04	7.73	1.41
Card VI	6.93	2.33	7.13	2.25
Card VII	5.00	2.95	5.93	3.09
Card VIII	4.47	2.41	3.20	2.32
Card IX	3.07	2.32	3.40	2.27
Card X	3.33	2.75	3.40	2.58

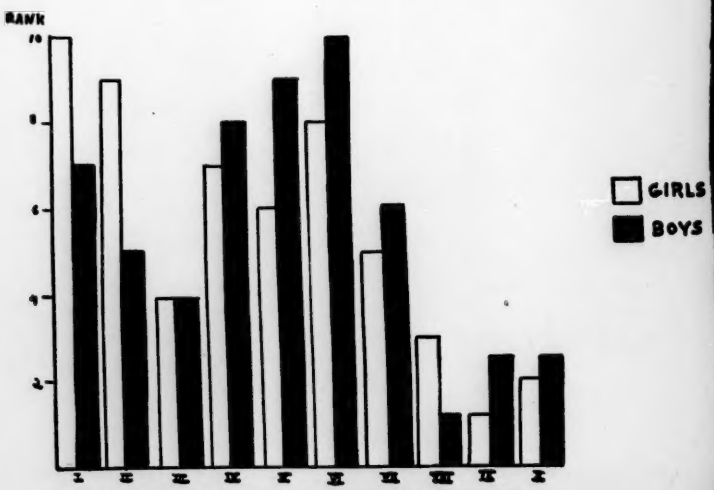

Fig. 1. Comparison of girls' absolute ranks with boys' absolute ranks.

which is upsetting at this particular age level. However, card III, which has an identical red, showed no differentiation at all between the sexes.

Tests of the significance of differences between sexes were negative except for a markedly lower *variability* in *boys* for card V. Boys, when compared with girls, not only disliked this card, but they are extremely consistent in this dislike.

Rank difference correlation between the mean preferences of boys and girls yielded a coefficient of .72, showing a fair degree of agreement between sexes.

Differences according to prior Preference for Color

Subjects who chose an achromatic card first, of which there were six (Group A), were compared with those who chose a colored figure first (Group B, $N = 24$). Differences between these groups in the ranks for the figures were insignificant statistically except for card VII, preferred by Group A, and card X, preferred by Group B.

Rank difference correlations of the mean preferences for these two groups yielded a coefficient of .12, indicating considerable difference between the two groups.

Evaluation of Individual Conformity

Rank order correlations were computed between each individual and the absolute ranks of his sex. For girls they range from —.47 to .98 with median correlation being .59. For boys they range from —.28 to .84 with a median correlation of .62.

Here is the Rorschach record of the girl (subject 5 in Table II) who conformed the most ($r_P = .98$):

Age: 16 yrs., 1 mo.
I.Q.: 154

R total 51

W	11 (s 1)	M	8	A	13	F+	81
D	36 (s 1)	M.Y	1	H	11	A	25
Dd	4	CF	5 (—, 2)	Hd	9	P	8
	—	FC	4	Ls	4	s	2
	51	FV.Y	1	Bt	4		
		YF	2	Im	2		
		FY	7 (—, 1)	An	1		
		F+	17	Rc	1		
		F—	4	Mu	1		
		F	2	Bl	1		
			—	Fd	1		
			51	Pr	1		
				Cg	1		
Z 48				Art	1	Total time	20′
Ap W(!) D Dd)					—	T/R	23″
Seq irregular		Exp 9/7			51	T/first R	11″

Figure I (11″)

1. "Looks like two witches with wings hanging on to something"
2. "Or else like a Hallowe'en mask"
   "That's about all I see"
3. "Like a bell in the center" (Dd 24)
4. "Like an eagle on the back, some sort of bird" (atypical—upper half)

Figure II (15″)

5. "Two people sitting down with their hands in front of their faces together"
6. "Like two people standing upside down on their heads" (D 1)
7. "Like a couple of animals—don't know what kind" (D 1 and D 2)

Figure III (5″)

8. "Two people trying to lift something" (D 1)
9. "In the middle is a hair bow" (D 3)
10. "Someone with arms raised up in the air" (D 4, 5, and 11)
11. "These are chickens with long tails" (D 2)

Figure IV (5″)

12. "Two boots" (D 6)
13. "Flower up at the top" (D 3)
14. "Two arms hanging out at sides" (D 4)
15. "Hands" (Dd 26 and Dd 28)
16. "Like a person" (D 6)
17. "Two profiles"
18. "Two animals together" (D 1)

Figure V (3″)

19. "Like a bat, the flying—not a baseball bat"
20. "Two heads" (D 5)
21. "Some legs" (D 1)
22. "Might be a corsage with ribbons"

Figure VI (30″)

23. "Up there is a face, a profile" (D 6)
24. "Like some bushes and reflection in the water below"
25. "Here's another profile" (D 4)
26. "Like a bearskin rug" (D 1)
27. "Some sort of animal or bug" (D 3)

Figure VII (11″)

28. "Two Indians doing a dance"
29. "Rock formations"
30. "Two girls dancing"
31. "And a hand"

Figure VIII (4″)

32. "Some sort of sea crab or lobster" (atypical D 2, 4, and 5)
33. "And bones" (D 3)
34. "Some sort of animal" (D 1)
35. "As a whole, a symbol for a coat-of-arms or something"
36. "And a basket" (D 2)

Figure IX (11″)

37. "A fountain of water" (D 5)
38. "Two old ladies pumping water" (D 1)
39. "And a head of a man" (D 1)
40. "And an ice cream sundae" (Ds 8)
    "Another profile" (D 1—precision alternative)
41. "Two men with pointed heads" (D 3)
42. "And a dagger or sword" ("Red looks like blood dripping off") (D 5)

Figure X (17″)

43. "Lots of different sort of fish"
44. "Octopus" (D 1)
45. "Crabs" (D 7)
45. "And sea coral" (D 9)
47. "Leaves" (Dd 21, 22 and 23)
48. "Two old ladies" ("Like bent a little bit") (D 9)
49. "Two sea horses" (D 4)
50. "And spurs, like on a horse" (D 3)
51. "Trunk of a tree with roots" (D 11)
    "Radio man's earphones" (D 3)

This is the record of the least conforming girl (No. 9 in Table II) ($r_p = -.47$):

Age: 16 yrs., 6 mos.
I.Q.: 113

R total 16

W	2	M	2	A	9	F+	90
D	12	CF	1	H	2	A	56
Dd	2 (s 1)	FC	1	Hd	1	P	4
	—	FY	2	Rc	1	s	1
	16	F+	9	Cg	1		
		F—	1	Hh	1		
Z	22.5		—	Mu	1	Total time	11′
Ap	(W) D Dd		16		—	T/R	41″
Seq	methodical	Exp	2/1.5		16	T/first R	27″

Figure I (13″)

1. "Sort of like two little angels—on each side with some sort of thing in the middle"
2. "Bell or something like that" (Dd 24)

Figure II (25″)

3. "Can't think of anything it looks like"
   "Two dogs facing each other" (D 1)
   "Can't see anything else"

Figure III (25″)

4. "Two men on either side of a table"
5. (D 1 and D 7)

Figure IV (55″)

6. "A boot" (D 6)
7. "Dog's head" (atypical D)

Figure V (4″)

8. "Butterfly"

Figure VI (23″)

9. "This looks like some sort of insect" (D 3)
10. "A face, sideways" (D 4)

Figure VII (20″)

11. "Two little dogs facing each other" (D 2)

Figure VIII (7″)

12. "Animal on either side" (D 1)
"Guess that's all"

Figure IX (75″)

13. "Some sort of an animal" (D 1)
14. "Could be a mask" (Dd 22 and Dds 23)

Figure X (35″)

15. "Frogs" (D 8)
16. "Caterpillar" (D 4)
"Guess that's all"

The following record is that of the boy (No. 8 in Table III) conforming most ($r_P = .84$):

Age: 17 yrs., 4 mos.
I.Q.: 117

R total 37

W	4 (s 1)	M	1	A	17	F+	77
D	29	C	1	Ad	3	A	54
Dd	4	CF	2 (—, 2)	H	3	P	9
	—	FC	2 (—, 2)	Hd	2	s	1
	37	Y	1	Fd	2		
		FY	3 (—, 1)	Cg	2		
		FV	1	Ge	2		
		F+	20	Im	1		
		F—	6	Hh	1		
			—	Art	1		
			37	Ls	1		
				Pr	1		
Z	9			Cl	1	Total time	27′
Ap	(W) D! Dd				—	T/R	44″
Seq	methodical	Exp	1/4.5		37	T/first R	17″

Figure I (17″)

1. "Well, looks something like a bat"
"I don't see anything else it could be"

Figure II (51″)

2. "Something like a pair of feet here" (D 2)
3. "This way like a map of the United States somewhat—just the black part" (D 6)
   "About all I can make out"

Figure III (7″)

4. "Looks like two people standing here"
5. "This looks like a butterfly" (D 3)
6. "Something like a horse with a long tail" (D 2)
7. "Man could be standing over a kettle" (D 8)
8. "These two look like a pair of shoes" (D 4)
9. "That could be a fish" (D 5)
10. "Think that's all"

Figure IV (11″)

11. "Whole figure looks something like a man laying down as you look at him from his feet"
12. "Something like a bearskin rug"
13. "This looks like a caterpillar" (D 1)
14. "These are shoes" (D 2)
15. "This looks like a snake here" (D 4)
    "That's about all"

Figure V (5″)

16. "That looks more like a bat than the first one"
17. "This in here looks like some kind of a person" (D 5)
    "That's all"

Figure VI (18″)

18. "Top part looks like an Indian totem pole" (D 3)
19. "Looks like dark clouds in the distance" (D 4)
20. "Could be a rug of some kind of animal" (D 1)
21. "Looks something like the head of a beetle"
    "Think that's all"

Figure VII (18″)

22. "Could be an island with a sort of a bay in here"
23. "This looks like a monkey down on his knees" (D 2)
24. "This here could be a dam with a river above it" (Dd 29)
    "Can't see anything else"

Figure VIII (14″)

25. "Could be a dog" (D 1)
26. "Could be a spider web" (D 3)
27. "That's all"

Figure IX (6″)

28. "These look like an ocean sea horse" (D 3)
29. "Could be a bust of a man" (D 4)
30. "This looks like an apple cut in half" (Dd 24)
31. "This looks like a frog sitting" (D 1)
    "Think that's all"

Figure X (20″)

32. "Could be an octopus" (D 1)
33. "Some sort of a bug" (D 8)
34. "This looks like a rabbit's head" (D 5)
35. "Head of a shark" (Dd 22)
36. "Fried egg" (D 2)
37. "Drapes around the window" (D 10)
"Think that's all"

Finally, the least conforming boy (No. 1 in Table III) presented the following Rorschach record ($rp = -.28$):

Age: 17 yrs., 6 mos.
I.Q.: 128

R total 21

W	6 (s 2)	M	1	H	1	F+	91
D	15 (s 4)	M.FC	1	Hd	2	A	43
	—	C	1	A	9	P	8
	21	FC	1 (—, 1)	Ls	3	s	6
		Y.V	1	Na	2		
		CF.V	1	Ob	1		
		FY	4	Art	1		
		F+	10	Pr	1		
		F—	1	Cg	1		
Z 40.5			—		—	Total time	13′
Ap W! D			21		21	T/R	34″
Seq methodical		Exp 2/3.5				T/first R	17″

Figure I (7″)

1. "Bat or something" (*atypical D, entire upper half*)
2. "Or landscape"
"Looks better upside down—landscape or something. Shadows on lake or river late at night"

Figure II (8″)

3. "My first impression, two comic strip characters playing patty cake—Woody Woodpecker"
4. "Sun going down between hill a long way off—top half" (D 3)

Figure III (6″)

5. "Two eighteenth century men bowing to each other or arguing over who's
6. *going to carry a package*" (*D 1 and D 7 with white space*)
7. "Pretty much like a good bow tie" (D 3)

Figure IV (9″)

8. "Pair of feet from a clown" (D 2)
9. "Looks like a bearskin tacked out on a wall like we used to do"
"Just like a pair of Army combat boots" (D 2)

Figure V (14″)

10. "Looks like a flying animal of some kind"
"Large butterfly, the antenna"
"Can't see anything else"

Figure VI (25″)

11. "Doesn't bear any resemblance to anything"
"From that end, pretty picture of rather symmetrical tree"

Figure VII (8″)

12. I've got pottery at home that looks like that. Deer bookends—turning head up as if looking over shoulder"

Figure VIII (9″)

13. "Some animal, like statue of jungle cat standing on top of a ridge, peering
14. over" (D 1 and D 2, 4, 5)

Figure IX (3″)

15. "Sea horses" (D 3 with white space as eye and mouth)
16. "Like Chinaman; eyes, nose, mustache—Fumanchu type of Chinaman" (D 4)
17. "Could easily be profile—eyes, forehead, shock of hair, nose" (D 1)

Figure X (85″)

"Pretty—can't make anything out"
"It's just like quite a few different colors"
(Urged to respond)
18. "Bears a faint resemblance to a beach scene" (atypical *D*)
19. "Large spider crab with large claws" (D 1)
20. "Rabbit's head right there, green" (D 5 with white space as muzzle)
21. "Crude drawing of parrot" ("very crude drawing like my sister would make") (D 8)

Investigation into factors related to the preferences shown by the rankings. Rank order correlations were computed between each individual's rankings and individual ranks based on time per-first-response, number of response, and F+ percentage on the ten ink blots. Table V presents median, maximum and minimum coefficients for three Rorschach indices.

From the foregoing it would seem that preference rankings are not determined by reaction time, productivity (*R*), or points of ego strength (F+ percentage). The highest median correlation was .40. This suggests

TABLE V

MEDIAN, MINIMUM, AND MAXIMUM COEFFICIENTS FOR THREE RORSCHACH INDICES

	Median		*Minimum*		*Maximum*	
	Girls	Boys	Girls	Boys	Girls	Boys
T/first R	.02	.07	—.66	—.57	.71	.83
R	.36	.40	—.74	—.16	.79	.77
F+ percentage	.09	.24	—.40	—.40	.62	.65

a slight, though variable, relationship between preference for a card and productivity for it. In general, these correlations suggest that the subject responds to each card as a "Gestalt," and that no single factor alone determines his response.

Correlations between rankings and number of color responses for each figure were as follows:

Card II	—.19
Card III	.06
Card VIII	—.21
Card IX	—.40
Card X	—.20

Correlations between rankings and number of shading responses for each figure were as follows:

Card I	.16
Card IV	—.24
Card V	.32
Card VI	.36
Card VII	—.001

For the colored cards the later the preference, the fewer were the color responses. In other words, with earlier preference for the card, the more color was used, and, thus, theoretically, the more the blots were responded to affectively. The correlations between rankings and the amount of shading demonstrated in the responses were low. A positive correlation was obtained on cards I, V, and VI. This means that the later the preference for the specific card, the lower the amount of shading determining the responses to that card. Theoretically, in other words, these cards tended to be preferred which presumably do not arouse dysphoric feeling, passivity, or inferiority feelings.

Surveying the *stated* reasons for preference, the largest number of both boys and girls preferred a card because of its color, then because of the content which they saw in the blot, and lastly because it seemed meaningful. Girls gave a specific ink blot a late ranking because of its content, then because it seemed meaningless to them, and a few because it was lacking in color or they did not like the color. Boys preferred cards least because they were meaningless, and secondly because of their dislike of the color or shading.

Examples of why the card was liked or disliked because of meaningfulness are "Can't make much out," "Because definitely something," "Doesn't mean anything to me," or "Hard to distinguish anything." Content determining choices is shown by such statements as "Look ready to kill each

other," "Vampire—dislike most," "Because pretty butterfly," or "Like bunnies, fountain, or idea of church." Specific illustrations of color determining like or dislike are "Color helps see better," "Color combination," "Color repulsive," or "Don't like all black."

Discussion

Statistically significant differences between groups were obtained on cards V, VII, and X. Rabin and Sanderson (5) list the following reasons why some cards are more difficult and less preferred:

1. There is evidence showing that some cards are *objectively* more difficult while others are easy in terms of the length of response time.
2. There is also evidence that proves that some cards are *objectively* more productive (in terms of average number of responses) than others.
3. Considerable doubt is, therefore, cast upon the validity of the "color shock" which is attributed to the suddenness of the appearance of color in the temporal series. It may well be due to actually greater difficulty of certain cards and less potentiality of others to evoke responses.

Another reason why a blot may be disliked, mentioned by Wallen (7), is that "in some instances the shape of the blot makes it hard to develop a meaningful percept, and this difficulty may produce an emotional reaction in the insecure person."

The first question to ask in regard to the present data is "Why is card V one of the least preferred blots?" In general clinical experience, it is cards IV and VI which are especially likely to produce shading shock rather than card V. Rorschach stated that V was the easiest form to interpret, almost always as a "bat" or a "moth." Wallen describes card V as a simple, compact figure which is often seen as a butterfly; he also found that this card was popular with his subjects. He found that "even when the sequence is reversed and it follows four achromatic cards, as in the photo set, its popularity is relatively unchanged." Another finding of his was that with his unstable groups, card V ranks highest in popularity, probably because it is quickly seen as a bat or butterfly.

Only in one instance did a subject, a girl, like card V most. It was the least preferred ink blot for three girls and two boys. Fourteen girls and eleven boys gave popular responses to card V, fourteen girls and eleven boys gave at least one whole response, and four girls and five boys made responses partially determined by shading.

Just what the factor or factors are which make this particular ink blot unpopular with these adolescents has not been determined. Evidently there is something about card V which makes them respond to it unfavorably. Perhaps the heavy black shading arouses anxiety in this age group. Why there would be more variability in the girls' rankings and more constant dislike of this card by the boys is also unknown.

Card VII was the most liked ink blot by four girls and one boy. In general, it was also the most liked of the achromatic cards. This card is supposed, by some, to represent the mother figure and security. Perhaps those who rank it first had a greater need for security than those who chose a chromatic card first.

Rorschach states that card X is composed of disparate blots and that whole answers are, for most subjects, almost impossible. Eight girls and

TABLE VI

TABLE OF APPROACH TYPES

Girls		*Boys*	
Approach Type	No. of Subjects Using	Approach Type	No. of Subjects Using
W D Dd	5	W D Dd	1
W D !	2	W D (Dd)	1
W D (Dd)	2	W D Dd !	2
W ! D Dd	2	W ! (D) Dd	1
W ! (D)	1	W ! D (Dd)	1
(W) D Dd	2	W ! Dd	1
(W) D ! Dd	1	(W) D !	1
		(W) D D !	5
		(W) D ! Dd	1
		D ! Dd	1

two boys gave a popular response to this card, two girls and two boys did not have color as a factor determining a single percept, seven girls and five boys gave at least one whole response, and eleven girls and ten boys responded with three D percepts or more. Card X was ranked first by seven girls and four boys; it was ranked last by only one boy.

The Pearson r between rankings and amount of color used in the responses to card X was —.20. Thus, there is some suggestion that the more the card was preferred, the more was the amount of color used in determining the responses. Why the t-test between the mean rankings of Group A and Group B should be significant at the one per cent level can only be conjectured. It is interesting to note that the t-test for card IX was extremely insignificant. Perhaps for the six subjects preferring a black-white card, neurotic shock did not manifest itself until the last ink blot. This would account for their ranking this ink blot as one which was less preferred.

No statistically significant difference was found between girls and boys on cards IV and VI. Card IV has been suggested as representing the paternal figure and authority while card VI is the one which is supposed to have

most provocation of sexual material. Furthermore, there was no significant difference between boys and girls on card VII which presumably represents the maternal figure and security.

Table VI shows the approach types used by the fifteen girls and the fifteen boys. It would seem logical that those individuals who respond to the whole blot primarily and those who respond to details primarily, would form their Gestalt impression of the ink blots in a similar manner. The one group's perception would be determined by the entire ink blot; the other group's impression would be determined by the details of the card which attracted their attention.

The rank order correlations between individual's ranking and T/first R, No. of R, and F+ percentage showed that none of these factors is a determinant of the rankings (judging from the median correlations). This suggests that multiple factors determine an individual's impression of a specific ink blot.

The correlations between individual's ranks and the rankings of their group illustrate the possibility of using normative rankings for diagnostic clinical purposes. Comparison of a patient's rankings with the normative ranks for his age group would show whether he differed greatly from normal individuals. Also it is possible that different types of maladjustment would show specific patterns of rankings. Thus, rankings might possess differentiating power between various so-called "mental diseases."

Summary and Conclusions

1. The thirty adolescents differed from Beck's adult control group by showing scores which suggest, according to Rorschach theory, more hostility or rebellion, less ego strength, greater effort at adapting to the everyday world, less conformity to the popular thinking of their culture, and less capacity to grasp relations not perceived by others.

2. Both boys and girls preferred (as shown by group ranks) the colored cards to the black-white ones. The one exception was the ranking of card II by the group of girls; however, this card, with its suggestion of blood, might be expected to bring forth an unfavorable response at this particular phase of their physiological development.

3. Of the six subjects who preferred an achromatic card first, five selected card VII. This card is thought to stand for the maternal figure and security. Perhaps this shows some conflict over whether they feel ready for independence and responsibilities.

4. Statistically significant differences as shown by a *t*-test were found:
   a. Between girls and boys on the variability of ranking on card V, the *girls* being more variable.

b. Between the means of Group A and Group B on card VII.
c. Between the means of the preceding groups on card X.

5. Rank order correlations between individual rankings and their group's rankings indicate the possibility of determining normative ranks from which an evaluation of an individual's adjustment might be made.

6. Rank order correlations showed that rankings were not determined by either T/first R, No. of R, or F+ percentage. Perhaps this indicates that subjects respond to the ink blots as a whole and that no single factor determines their response. There was suggestion of a tendency for production to be greater on cards preferred.

7. Pearson *r* between rankings and amount of color used in responding to a chromatic ink blot are low negative correlations. This suggests that the more the specific card was preferred, the more the subject was responding to the card affectively. The correlations between rankings and shadings were low, positive correlations for cards I, V, and VI. Thus, the more a black-white card is preferred, the less dysphoric feeling that card arouses.

8. Further research is needed to determine whether this type of Rorschach card ranking will differentiate clinical groups.

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